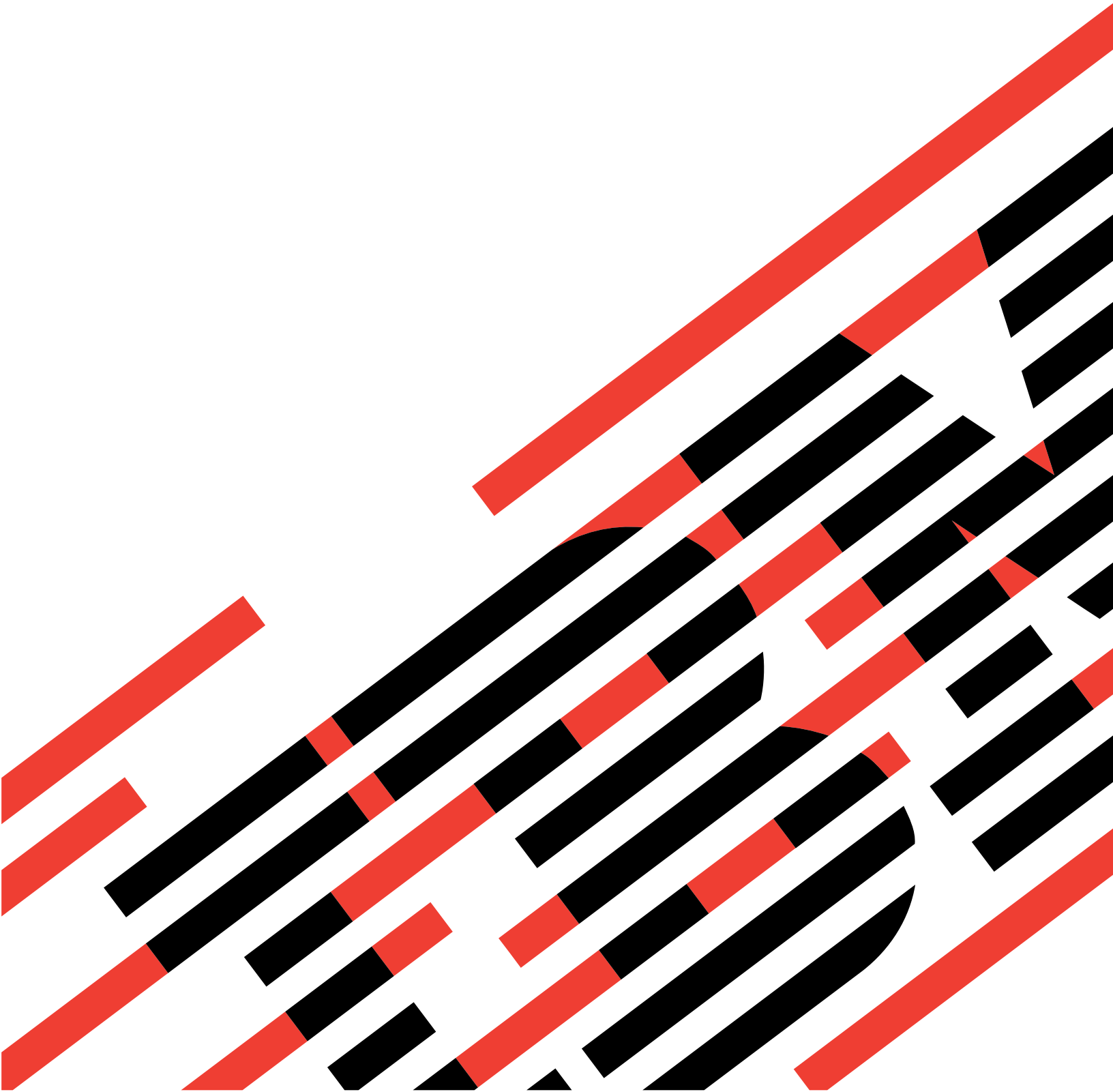
IBM

eserver

xSeries 335 Type 8676, Type 8830

Hardware Maintenance Manual and Troubleshooting Guide



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Note

Before using this information and the product it supports, read Appendix C, “Notices”, on page 161.

Fourth Edition (January 2003)

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About this manual

This manual contains diagnostic information, a Symptom-to-FRU index, service information, error codes, error messages, and configuration information for the IBM® @server xSeries™ 335.

Important: The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM xSeries products. See the parts listing in “System” on page 116 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

Important safety information

Be sure to read all caution and danger statements in this book before performing any of the instructions. See “Safety information” on page 123.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

在安装本产品之前，请仔细阅读 Safety Information
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Lea atentamente todas las declaraciones de precaución y peligro ante de llevar a cabo cualquier operación.

Online support

You can download the most current diagnostic, BIOS flash, and device driver files from http://www.ibm.com/pc/support on the World Wide Web.

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Chapter 1. General information

The IBM @server xSeries 335 server, Type 8676 and Type 8830, is a 1-U-high[1] rack model server for high-volume network transaction processing. This high-performance, symmetric multiprocessing (SMP) server is ideally suited for networking environments that require superior microprocessor performance, input/output (I/O) flexibility, and high manageability.

Performance, ease of use, reliability, and expansion capabilities were key considerations in the design of your server. These design features make it possible for you to customize the system hardware to meet your needs today and provide flexible expansion capabilities for the future.

If you have access to the Internet, you can obtain up-to-date information about your server and other IBM server products at http://www.ibm.com/eserver/xseries/ on the World Wide Web.

The latest version of this publication is available from the IBM Web site. Go to http://www.ibm.com/ and click **Support & downloads**. In the **Technical support** keyword search field, type 8676 (or 8830) and click **Go**. A list of publications for your server is displayed.

Note: The illustrations in this document might differ slightly from the hardware.

Related publications

This *Hardware Maintenance Manual and Troubleshooting Guide* is provided in Portable Document Format (PDF) on the IBM *xSeries Documentation* CD. It contains information to help you solve the problem yourself or to provide helpful information to a service technician.

In addition to this *Hardware Maintenance Manual and Troubleshooting Guide*, the following xSeries 335 Type 8676 and Type 8830 documentation is provided with your server:

- *User's Guide*
  The *User's Guide* contains general information about the server.
- *Installation Guide*

  This printed publication contains instructions for setting up your server and basic instructions for installing some options.
- *Option Installation Guide*

  This publication is in PDF on the IBM *xSeries Documentation* CD. It contains detailed instructions for installing, removing, and connecting optional devices that your server supports.
- *Safety Book*
  This multilingual publication is provided in PDF on the IBM *xSeries Documentation* CD. It contains translated versions of the caution and danger statements that appear in the documentation for your server. Each caution and danger statement has an assigned number, which you can use to locate the corresponding statement in your native language.

1. Racks are marked in vertical increments of 1.75 inches each. Each increment is referred to as a unit, or a ″U″. A 1-U-high device is 1.75 inches tall.

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- *Rack Installation Instructions*
  This printed publication contains the instructions to install the server in a rack.

Depending on your server model, additional publications might be included on the IBM *xSeries Documentation* CD.

Notices and statements used in this book

The caution and danger statements used in this book also appear in the multilingual *Safety Book* provided on the IBM *xSeries Documentation* CD. Each caution and danger statement is numbered for easy reference to the corresponding statements in the safety book.

The following types of notices and statements are used in this book:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Features and specifications

Table 1 on page 3 provides a summary of the features and specifications for your server.

Note: You can use the Configuration/Setup Utility program in your server to determine the specific type of microprocessor on your system board.

Table 1. Features and specifications

Microprocessor:

- Intel® Pentium® 4 microprocessor
  - Minimum: One
  - Maximum: Two
- 512 KB Level-2 cache
- 400 MHz front-side bus (FSB)

Memory:

- Type: error correcting code (ECC), double-data rate (DDR) SDRAM, registered DIMMs
  - Minimum: 512 MB
  - Maximum: 4 GB (enabled for 8 GB)
- Four slots, interleaved

Drives standard:

- Diskette: 1.44 MB
- CD-ROM: IDE

Hard disk drives:

- Slim-high drives, hot-swap SCSI or non-hot-swap IDE (drive capacity and speed vary with model)
- Maximum: Two

Expansion slots:

- One full-length adapter slot supports up to 100 MHz/64-bit PCI-X adapters (bus A)
- One half-length adapter slot supports up to 100 MHz/64-bit PCI-X adapters (bus B) or 33 MHz 32-bit PCI adapters (bus C)
- Supports 3.3 V or universal adapters only

Power supply:

One 331 watt (115-230 V ac)

Video:

- ATI RageXL video controller integrated on system board
- Compatible with SVGA
- 8 MB SDRAM video memory

Size

- Height 43 mm (1.69 in.)
- Depth: 660 mm (25.98 in.)
- Width: 440 mm (17.32 in.)
- Weight: approximately 12.7 kg (28 lb) when fully configured

Integrated functions:

- Integrated system management processor (ISMP) with one ISM (RS-485) connector
- One SCSI controller with RAID1 capability
- Two Broadcom 10/100/1000 Ethernet controllers with Wake on LAN® support and Alert Standard Format (ASF)
- Three Universal Serial Bus (USB) ports
- One serial port
- Two Cable Chaining Technology (C2T) ports (one In, one Out)

Acoustical noise emissions:

- Declared sound power, idling: 6.5 bels
- Declared sound power, operating: 6.5 bels

Environment:

- Air temperature:
  - Server on: 10° to 35°C (50.0° to 95.0°F). Altitude: 0 to 914 m (2998.7 ft)
  - Server on: 10° to 32°C (50.0° to 89.6°F). Altitude: 914 m (2998.7 ft) to 2133 m (6998.0 ft.)
  - Server off: 10° to 43°C (50.0° to 109.4°F). Maximum altitude: 2133 m (6998.0 ft)
- Humidity:
  - Server on: 8% to 80%
  - Server off: 8% to 80%
- Airflow rates:
  - Minimum: 31.4 CFM
  - Maximum: 39.2 CFM

Heat output:

Approximate heat output in British thermal units (Btu) per hour:

- Minimum configuration: 375 Btu (110 watts)
- Maximum configuration: 1195 Btu (350 watts)

Electrical input:

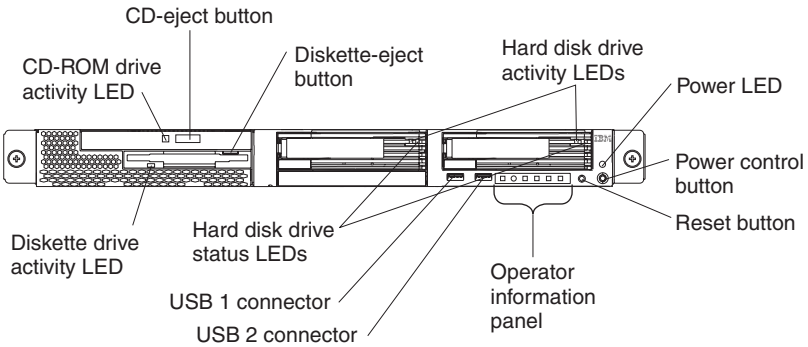
- Sine-wave input (50-60 Hz) required
- Input voltage low range:
  - Minimum: 100 V ac
  - Maximum: 127 V ac
- Input voltage high range:
  - Minimum: 200 V ac
  - Maximum: 240 V ac
- Input kilovolt-amperes (kVA), approximately:
  - Minimum: 0.110 kVA
  - Maximum: 0.350 kVA

Server controls, LEDs and power

This section describes the controls and light-emitting diodes (LEDs) and how to turn the server on and off.

Front view

The following illustration shows the controls, LEDs, and connectors on the front of the server.



CD-ROM drive activity LED: When this LED is lit, it indicates that the CD-ROM drive is in use.

CD-eject button: Press this button to release a CD from the CD-ROM drive.

Diskette-eject button: Press this button to release a diskette from the diskette drive.

Hard disk drive activity LEDs: When either of these LEDs is flashing, it indicates that the associated hard disk drive is in use.

Power LED: When this LED is lit, it indicates that ac and dc power are present in the server. When this LED is flashing, it indicates that the server is in Standby mode. When this LED is off, ac power is not present, or the power supply or the LED itself has failed. A power LED is also on the rear of the server.

Note: If this LED is off, it does not mean that there is no electrical power in the server. The LED might be burned out. To remove all electrical power from the server, you must disconnect the power cord from the electrical outlet.

Power-control button: Press this button to turn the server on and off manually.

Reset button: Press this button to reset the server and run the power-on self-test (POST). You might have to use a pen or the end of a straightened paper clip to press the button.

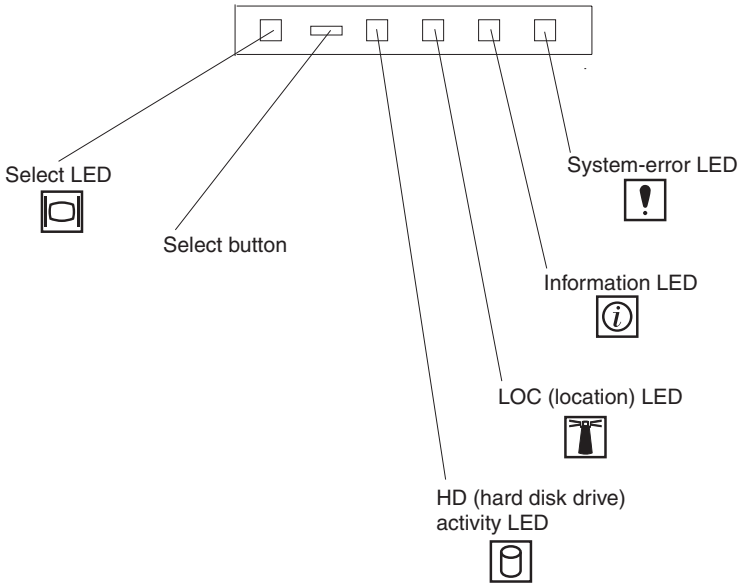
USB connectors: Connect USB devices to these connectors.

Hard disk drive status LEDs: When either of these LEDs is lit, it indicates that the associated hard disk drive has failed. If an optional RAID adapter is installed in the server and the LED flashes slowly (one flash per second), the drive is being rebuilt. If the LED flashes rapidly (three flashes per second), the controller is identifying the drive.

Diskette drive activity LED: When this LED is lit, it indicates that the diskette drive is in use.

Operator information panel

The following illustration shows the controls, LEDs and connectors on the operator information panel.



System-error LED: When this LED is lit, it indicates that a system error has occurred. A system-error LED is also on the rear of the server. An LED on the Light Path Diagnostics panel on the system board is also lit to help isolate the error.

Information LED: When this LED is lit, it indicates that a noncritical event has occurred and is identified in the error log.

LOC (location) LED: Use this blue LED to visually locate the server if it is in a location with numerous other servers. You can use IBM Director to light this LED remotely.

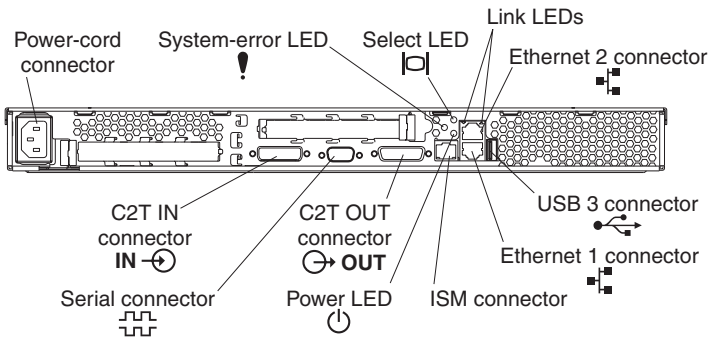
HD (hard disk drive) activity LED: When this LED is lit, it indicates that either of the hard disk drives is in use.

Select button: Press this button to select this server to use the monitor, keyboard, and pointing device in a C2T chain.

Select LED: When this LED is lit, it indicates that this server is using the monitor, keyboard, and pointing device in a C2T chain. If the server is not part of a C2T chain, this LED remains lit. A select LED is also on the rear of the server.

Rear view

The following illustration shows the connectors and LEDs on the rear of the server.



Power-cord connector: Connect the power cord to this connector.

System-error LED: When this LED is lit, it indicates that a system error has occurred. An LED on the Light Path Diagnostics panel on the system board is also lit to help isolate the error. A system-error LED is also on the front of the server.

Select LED: When this LED is lit, it indicates that this server is using the monitor, keyboard, and pointing device in a C2T chain. If the server is not part of a C2T chain, this LED remains lit. A select LED is also on the front of the server.

Tx/Rx LEDs: These LEDs are on the dual Ethernet connector. When the up-arrow or down-arrow LED is lit, it indicates that there is activity between the server and the network attached through the upper or lower connector.

Ethernet connectors: Use these connectors to connect the server to a network.

USB connector: Connect a USB device to this connector.

ISM connector: Use this connector to connect the server to an optional Remote Supervisor Adapter.

Power LED: When this LED is lit, it indicates that ac and dc power are present in the server. When this LED is flashing, it indicates that the server is in Standby mode. When this LED is off, ac power is not present, or the power supply or the LED itself has failed. A power LED is also on the front of the server.

Note: If this LED is off, it does not mean that there is no electrical power in the server. The LED might be burned out. To remove all electrical power from the server, you must disconnect the power cord from the electrical outlet.

C2T Out connector: Connect a breakout cable to this connector, or use this connector to connect the server to the C2T In connector of another server in a C2T chain.

Serial connector: Connect a 9-pin serial device to this connector.

C2T In connector: Use this connector to connect the server to the C2T Out connector of another server in a C2T chain.

If you have an optional Remote Supervisor Adapter (system-management adapter) installed in PCI slot 1, your server has additional connectors and LEDs. See the *Option Installation Guide* for more information about these connectors and LEDs.

Server power features

When you connect the server to an ac power source, the server goes into Standby mode. After approximately 20 seconds, the power-control button becomes active, and you can turn on the server and start the operating system by pressing the power-control button. The following section describes other ways in which the server can be turned on.

A power-control-button shield comes with your server. You can install this disk-shaped shield to prevent the server from being turned off accidentally.

Turning on the server

After the server is connected to an ac power source, it can be turned on in any of the following ways:

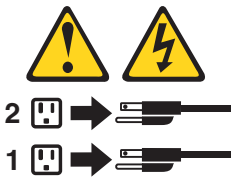
- You can press the power-control button.
- If a power failure occurs while the server is turned on, the server will restart automatically when power is restored.
- If your operating system supports the system-management software for an optional Remote Supervisor Adapter, the system-management software can turn on the server.
- If your operating system supports the Wake on LAN feature, the Wake on LAN feature can turn on the server.

Turning off the server

Some operating systems require an orderly shutdown before you turn off the server. See your operating-system documentation for information about shutting down the operating system.

Statement 5:

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



The server can be turned off in any of the following ways:

- You can press the power-control button to start an orderly shutdown of the operating system, if your operating system supports this feature, and turn off the server.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the server.
- If the Wake on LAN feature turned on the server, the Wake on LAN feature can turn off the server.

- You can remove all power from the computer by disconnecting the server from the ac power source.

Standby mode

When the server is connected to an ac power source but has not been turned on, it is in Standby mode. When the server is in Standby mode, the operating system is not running, and all core logic except for the service processor is shut down. The power-on LED flashes to indicate that the server is in Standby mode. The server can respond to requests from the service processor, such as a remote request to turn on the server.

To put the server into Standby mode when the server is turned on, shut down the operating system (see your operating-system documentation), and press the power-control button.

The ISMP can also put the server into Standby mode. Additionally, if the server has an optional Remote Supervisor Adapter installed or is connected to an ASM interconnect network that contains at least one server with an optional Remote Supervisor Adapter installed, you can also put the server into Standby mode remotely through the Remote Supervisor Adapter user interface.

Chapter 2. Configuration

The following configuration programs and capabilities come with your server:

- **Configuration/Setup Utility program**

  This program is part of the basic input/output system (*BIOS*) code that comes with your server. You can use this program to change interrupt request (IRQ) settings, configure serial port assignments, change the drive startup sequence, enable USB keyboard and mouse support, resolve configuration conflicts, set the date and time, and set passwords. For information about using this utility, see "Using the Configuration/Setup Utility program" on page 10.

- **LSI Logic Configuration Utility**

  With the built-in LSI Logic Configuration Utility program, you can configure the integrated SCSI controller and the devices that are attached to it. See "Using the LSI Logic Configuration Utility program" on page 18.

- **ServeRAID configuration programs**

  These programs come with your server. If the server has a ServeRAID™ adapter installed, or if you are using the integrated RAID capabilities, you must use the ServeRAID configuration programs to define and configure the disk-array subsystem *before* you install the operating system. For information about using the ServeRAID configuration programs, see "Using the ServeRAID configuration programs" on page 19 and also the RAID documentation that comes with the RAID adapter.

- **ServerGuide Setup and Installation CD**

  The *ServerGuide™ Setup and Installation* CD provides software setup tools and installation tools that are specifically designed for your IBM server. Use this CD during the initial installation of your server to configure basic hardware features and to simplify your operating system installation. See "Using the ServerGuide Setup and Installation CD" on page 14 for more information.

- **Integrated Ethernet controller configuration process**

  The two integrated Ethernet controllers provide an interface for connecting to 10-Mbps, 100-Mbps, or 1000-Mbps networks. To configure the integrated Ethernet controllers, see "Configuring the Gigabit Ethernet controller" on page 19.

- **Integrated system management firmware update utility program**

  To update the integrated system management (ISM) firmware, see "Updating the integrated system management firmware" on page 20. You can get the update utility program from the IBM Support Web site at http://www.ibm.com/pc/support/ on the World Wide Web.

- **IBM Director**

  IBM Director is a workgroup-hardware-management tool that you can use to centrally manage xSeries servers; IBM NetVista™, IntelliStation®, and ThinkPad® computers, and non-IBM Intel-microprocessor-based systems. IBM Director automates tasks such as inventory-taking, monitoring of environmental sensors (such as temperature, voltage and fans), alerting, and system-health information.

  No further information about IBM Director is provided in this publication. For more information and instructions about IBM Director, see the IBM *Director User's Guide* on the CD that comes with your server.

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Using the Configuration/Setup Utility program

Use the Configuration/Setup Utility program to:

- View configuration information
- View and change assignments for devices and I/O ports
- Set the date and time
- Set and change passwords and Remote Control Security settings
- Set the startup characteristics of the server and the order of startup devices
- Set and change settings for advanced hardware features
- View and clear error logs

Starting the Configuration/Setup Utility program

Complete the following steps to start the Configuration/Setup Utility program:

1. Turn on the server.
2. When the prompt `Press F1 for Configuration/Setup` appears, press F1. If you have set both a power-on password and an administrator password, you must type the administrator password to access the full Configuration/Setup Utility menu. If you do not type the administrator password, a limited Configuration/Setup Utility menu is available.
3. Select settings to view or change.

Configuration/Setup Utility menu choices

The choices on the Configuration/Setup Utility main menu, listed below, are described more fully in the *User's Guide* on the IBM *xSeries Documentation* CD. Depending on the level of BIOS code installed on the server, the choices may differ slightly from those listed here.

- **System Summary**

  Select this choice to display configuration information.

- **System Information**

  Select this choice to display information, including Product Data, about your server. It appears only on the full Configuration/Setup Utility main menu.

- **Devices and I/O Ports**

  Select this choice to view or change the assignments for devices and input/output (I/O) ports. This choice appears only on the full Configuration/Setup Utility main menu.

  Note: The default setting is **Enabled** for all the controllers you can control from this menu. If you select **Disabled**, the system will not configure the disabled device and the operating system will not detect the device. (This is equivalent to unplugging the device.)

- **Date and Time**

  Select this choice to set the system date and time. This choice appears only on the full Configuration/Setup Utility main menu.

- **System Security**

  Select this choice to set passwords or the Remote Control Security settings. This choice appears only on the full Configuration/Setup Utility main menu. See "Using passwords" on page 12 and "Remote-control password" on page 14 for more information about passwords.

  Attention: If an administrator password is set and then forgotten, it cannot be overridden or removed. You must replace the system board.

- **Start Options**

  Select this choice to view or change the start options. This choice appears only on the full Configuration/Setup Utility main menu.

  Note: If the **Boot Fail Count** choice is enabled, you can restore the BIOS system defaults after three consecutive boot failures. If this choice is disabled, the BIOS system defaults can be loaded only from the Configuration/Setup Utility main menu.

- **Advanced Setup**

  Select this choice to change values for advanced hardware features, such as cache control, and PCI configuration. This choice appears only on the full Configuration/Setup Utility main menu.

  – **System Partition Visibility**

    Select this choice to indicate whether the System Partition is visible.

  – **Memory Settings**

    Select this choice to manually enable a pair of memory connectors.

    Note: If a memory error is detected during POST or memory configuration, the server will automatically disable the failing pair of memory connectors and continue operating with reduced memory capacity. If this occurs, you must manually enable the set of memory connectors after the problem is corrected.

  – **CPU Options**

    Select this choice to set the microprocessor cache mode to disabled, write-back, or write-through. Selecting write-back mode will provide better system performance.

  – **PCI Bus Control**

    Select this choice to view and set interrupts for PCI devices and to configure the master latency timer value for the server.

  – **Integrated System Management Processor Settings**

    You can view and enable or disable the **Reboot on System NMI** setting on this menu.

- **Error Logs**

  Select this choice to view or clear error logs.

  – Select **POST Error Log** to view the three most recent error codes and messages that the system generated during POST.

  – Select **System Event/Error Log** to view the System Event/Error Log.

- **Save Settings**

  Select this choice to save your customized settings.

- **Restore Settings**

  Select this choice to delete your changes.

- **Load Default Settings**

  Select this choice to cancel your changes.

- **Exit Setup**

  Select this choice to exit from the Configuration/Setup Utility program.

Additional Configuration/Setup Utility menu choices

When you install an IBM Remote Supervisor Adapter in your server, you can view additional menu choices in the Configuration/Setup Utility program, such as:

- **System Card Data**

Select this choice to display information about your server.

- **PCI Slot/Device Information**

  Select this choice to view the properties of adapters installed in PCI slots.
- **Administrator Password**

  Select this choice to set or change the administrator password.
- **Remote Control Security Settings**

  Select this choice to set a remote-control password. When you set a remote-control password, you can also set the number of failed attempts to enter the correct remote-control password, and the duration before another attempt is allowed.

For a list of supported options for your server, go to http://www.ibm.com/pc/us/compat/ on the World Wide Web. To order an optional Remote Supervisor Adapter, contact your IBM marketing representative or authorized reseller.

Using passwords

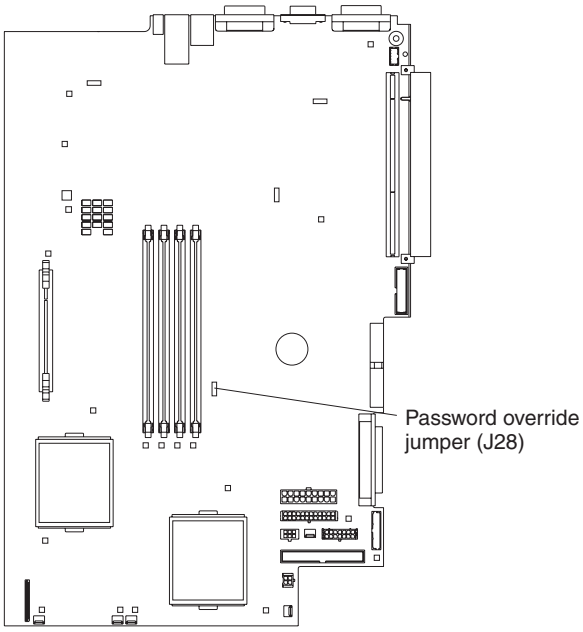
The **System Security** choice appears only on the full Configuration/Setup Utility menu. After you select this choice, you can implement two levels of password protection: power-on password and administrator password. The administrator password is available only if the optional IBM Remote Supervisor Adapter is installed in your server.

Power-on password: After you set a power-on password, you can enable the Unattended Start mode. This locks the keyboard and mouse but enables the operating system to start. The keyboard and mouse remain locked until you type the correct password.

You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for your power-on password. Keep a record of your password in a secure place. When a power-on password is set, POST is not completed until you type the password. If you forget the power-on password, you can regain access to the server through one of the following methods:

- If an administrator password is set, type the administrator password at the power-on prompt. (If necessary, see “Administrator password” on page 13 for details.) Start the Configuration/Setup Utility program and change the power-on password.
- Remove the battery and then reinstall the battery (see “Replacing the battery” on page 61).

- Change the position of the power-on password override jumper (J28), shown in the following illustration.



Complete the following steps to change the position of the password-override jumper:

1. Review “Safety information” on page 123.
2. Turn off the server and peripheral devices and disconnect all power cords and external cables; then, remove the cover. (See “Removing the cover and bezel” on page 46).
3. Change the position of the jumper on J28 to bypass the power-on password check. After you reconnect the cables and turn on the server, you can start the Configuration/Setup Utility program and change the power-on password.
4. Connect the server to a keyboard, monitor, and mouse; then, connect it to a power source.
5. Turn on the server. You can now start the Configuration/Setup Utility program and either delete the old password or set a new power-on password.

Administrator password: Select this choice to set an administrator password. The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords and allow a power-on password to be changed by the user. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for your administrator password. Keep a record of your password in a secure place. The administrator password is available only if an optional IBM Remote Supervisor Adapter is installed in your server.

Attention: If an administrator password is set and then forgotten, it cannot be overridden or removed. You must replace the system board.

The following table provides a summary of the password features.

Table 2. Power-on and administrator password features

Type of password	Features
Power-on password	• Type the password to complete the system startup. • All choices are available on the Configuration/Setup Utility main menu.
Administrator password	• No password is required to complete the system startup. • Type the password to access the Configuration/Setup Utility program. • All choices are available on the Configuration/Setup Utility main menu.
Administrator *and* power-on password	• You can type either password to complete the system startup. • The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords and allow a power-on password to be changed by the user. • The power-on password provides access to a limited set of choices on the Configuration/Setup Utility main menu. This limited access might include changing or deleting the power-on password.

Remote-control password: Select this choice to set a remote-control password. This enables an administrator to manage the server remotely. You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for your remote-control password. Keep a record of your password in a secure place. The remote-control password is available only if an optional IBM Remote Supervisor Adapter is installed in your server.

Using the ServerGuide Setup and Installation CD

The *ServerGuide Setup and Installation* CD includes an easy-to-use setup and installation program that is designed for your IBM server. The ServerGuide program detects the server model and hardware options that are installed and uses that information during setup to configure the hardware. The ServerGuide program simplifies operating-system installations by providing updated device drivers and, in some cases, installing them automatically.

To purchase the latest *ServerGuide Setup and Installation* CD, see the "ServerGuide Updates" flyer that comes with your server library, or go to the ServerGuide fulfillment Web site at http://www.ibm.com/pc/coupon/.

The ServerGuide program has the following features to make setup easier:

- An easy-to-use interface with online help
- Diskette-free setup, and configuration programs that are based on detected hardware
- ServeRAID Manager program, which configures your ServeRAID adapter or integrated SCSI controller with RAID capabilities
- A system BIOS update program, which updates the BIOS code directly from the CD
- Device drivers that are provided for your server model and detected hardware
- Operating-system partition size and file-system type that are selectable during setup

ServerGuide features

Features and functions can vary slightly with different versions of the ServerGuide program. To learn more about the version that you have, start the *ServerGuide Setup and Installation* CD and view the online overview. Not all features are supported on all server models.

The ServerGuide program requires a supported IBM server with an enabled startable (bootable) CD-ROM drive. In addition to the *ServerGuide Setup and Installation* CD, you must have your operating-system CD to install your operating system.

The ServerGuide program has the following features:

- Sets system date and time.
- Detects the SCSI RAID adapter, controller, or integrated SCSI controller with RAID capabilities and runs the SCSI RAID configuration program.
- Updates the licensed internal code (firmware) level without diskettes.
- Checks the system BIOS code and microcode (firmware) levels of supported options to determine whether a later level is available from the CD. You can perform updates without using diskettes.
- Creates a System Partition on the default drive. You can run server-specific utility programs after setup.
- Detects installed hardware options and provides updated device drivers for most adapters and devices.
- Creates a setup-replication diskette for replicating setup selections for other servers of the same model.
- Provides diskette-free installation for supported operating systems.
- Provides a replicated installation path for multiple installations of supported operating systems.
- Includes an online README file with links to tips for your hardware and operating-system installation.

Setup and configuration overview

When you use the *ServerGuide Setup and Installation* CD, you do not need setup diskettes. You can use the CD to configure any supported IBM server model. The ServerGuide program checks your system BIOS, service processors, and other system hardware to determine if system updates are available. The setup program provides a list of tasks that are required to set up your server model. On a server with a ServeRAID adapter or integrated SCSI controller with RAID capabilities, you can run the SCSI RAID configuration program to create logical drives.

Note: Features and functions can vary slightly with different versions of the ServerGuide program.

When you start the *ServerGuide Setup and Installation* CD, the program performs the following tasks:

- The ServerGuide program prompts you for your language, country, and keyboard layout. (This information is stored and later passed to the operating-system installation program.)
- The ServerGuide program displays choices for running the configuration programs. For example:
  - The Express Configuration method runs the required programs for your server, based on the hardware that is detected.
  - The Custom Configuration method displays all programs that are available for your server, and you decide which programs to run.

  - The Replicated Configuration method provides the option of duplicating your setup selections to other servers that are the same model.
- If you select the Custom Configuration method, the following features are optional. If you select the Express Configuration method, some or all of these features are run, depending on the hardware that is detected:
  - The Set Date and Time feature is provided so that you do not have to use the Configuration/Setup Utility program to access these settings.
  - The Clear Hard Disks feature is provided so you can delete all partitions on all hard disk drives.
  - The ServerGuide program checks the server BIOS code and microcode (firmware) levels for supported options and then checks the CD for a newer level. The CD content might be newer than the BIOS code and firmware level. The ServerGuide program can perform a flash update of the BIOS code and supported microcode (firmware) options without using diskettes.
  - The SCSI RAID configuration program starts, leading you through the entire configuration process.
  - The ServerGuide program creates a System Partition on the default drive.
- The ServerGuide program displays a confirmation summary, so that you will know when you have completed all the required tasks. Then, you are ready to install your operating system.

Notes:

1. Plug and Play adapters are configured automatically. Non-Plug and Play adapters or non-IBM adapters might require switch settings, additional device drivers, and installation after the operating system is installed. See the documentation that comes with the adapter.
2. Diagnostics for your server come in BIOS code or on a separate diagnostics CD.

System Partition

The ServerGuide program creates a 50 MB System Partition on the default drive. The System Partition contains server-specific utility programs such as service-processor disk operating system (DOS) utilities, system diagnostics, flash BIOS updates, and other programs. Programs in the System Partition vary by server model, and not all server models run utility programs from the System Partition. To determine which ones do, start the *ServerGuide Setup and Installation* CD and view the online overview.

After setup is complete, you can access programs in the System Partition by restarting the server and pressing Alt+F1 when the prompt is displayed. The **System Partition** menu displays the programs that are available on your server model.

Typical operating-system installation

You can use the ServerGuide program to shorten your installation time. The ServerGuide program provides the device drivers that are required for your hardware and for the operating system that you are installing. This section describes a typical ServerGuide operating-system installation.

Note: Features and functions can vary slightly with different versions of the ServerGuide program.

1. After you have completed the setup process, the operating-system installation program starts. (You will need your operating-system CD to complete the installation.)
2. The ServerGuide program stores information about the server model, service processor, hard disk drive controllers, and network adapters. Then, the program checks the CD for newer device drivers. This information is stored and then passed to the operating-system installation program.
3. With some operating-system installations, you can create an operating-system replication diskette for setting up additional servers. This diskette contains the Internet protocol (IP) address, server name, and other selections.
4. The ServerGuide program presents operating-system partition options that are based on your operating-system selection and the installed hard disk drives.
5. If you are installing the operating system from diskettes, the ServerGuide program lists the diskettes that you must create and the optional device-driver diskettes (for installed adapters or controllers) that you might want to create.
6. The ServerGuide program prompts you to insert your operating-system CD and restart the server. At this point, the installation program for the operating system takes control to complete the installation.

Setting up or updating multiple servers

You can use the ServerGuide program to create diskettes that help you set up or update multiple servers. You can modify information on the diskettes as you use them to set up or update other servers.

Note: Availability and function can vary by server model and by the hardware that is installed.

You can create a setup-replication diskette, which contains your hardware configuration selections. Use this diskette to replicate selections to other servers that are of the same model.

You can create an operating-system replication diskette, which contains information that you need to complete multiple installations. Not all operating systems support operating-system replication diskettes.

Installing your operating system without ServerGuide

If you have already configured the server hardware and you decide not to use the ServerGuide program to install your operating system, complete the following steps to download the latest operating-system installation instructions from the IBM Support Web page:

1. Go to http://www.ibm.com/pc/support/.
2. Under **Browse**, click **Servers**.
3. From the **Family** drop-down list, select your server model.
4. If operating-system installation instructions are available for your server model, **OS installation** is in the list in the upper-left corner of the Web page. Click **OS installation** and select the instructions for your operating system.

Using the LSI Logic Configuration Utility program

LSI Logic Configuration is a built-in, menu-driven configuration utility program that you can use to:

- Perform a low-level format of a SCSI hard disk drive
- Set a SCSI device scan order
- Set a SCSI ID for a controller

Notes:

1. The integrated SCSI controller with RAID capabilities in your server supports only RAID level-1. Installing an optional RAID adapter provides additional RAID levels. See “Using the ServeRAID configuration programs” on page 19 for information on configuring your server for RAID operation.
2. If you install a different type of RAID adapter in your server, use the configuration method supplied with the RAID adapter to view or change SCSI settings for attached devices.

The following sections provide instructions for starting the LSI Logic Configuration Utility program and formatting a SCSI hard disk drive.

Starting the LSI Logic Configuration Utility program

Complete the following steps to start the LSI Logic Configuration Utility program:

1. Turn on the server.
2. When the `<<< Press <CTRL><C> to start LSI Logic Configuration Utility >>>` prompt appears, press Ctrl+C.

   Note: If an administrator password has been set, you are prompted to type the password to start the LSI Logic Configuration Utility program.
3. Use the arrow keys to select a controller (channel) from the list of adapters; then, press Enter.
4. Follow the instructions on the resulting screen to change the settings of the selected items; then, press Enter. The **Device Properties** and **Mirroring Properties** choices produce additional screens of parameters to review or change.

Formatting a SCSI hard disk drive

Attention: Low-level formatting removes all data from the hard disk drive. If there is data you want to save, back up the hard disk drive before continuing this procedure.

You can use the LSI Logic Configuration Utility program to perform a low-level format on a SCSI hard disk drive. Complete the following steps to format a drive:

1. Select the controller channel for the drive to format from the list of adapters.
2. Select **Device Properties** from the resulting screen.
3. Use the arrow keys (↑ or ↓) to highlight the drive to format.
4. Use the arrow keys (← or →) or the End key to scroll to the right.
5. Highlight the **Format** item; then, press Enter to begin the low-level formatting operation.

Using the ServeRAID configuration programs

You can use the ServeRAID Manager utility, provided on the IBM ServeRAID Support CD that is shipped with the server, to:

- Configure a redundant array of independent disks (RAID)
- Restore a SCSI hard disk to factory-default settings, erasing all data
- View your RAID configuration and associated devices
- Monitor operation of your RAID controllers

The ServeRAID Manager program operates in two ways:

- Startable-CD mode
- As an installed software program

See the ServeRAID documentation on the IBM ServeRAID Support CD for additional information about RAID technology and instructions for using ServeRAID Manager. The Installation Guide for your server also contains instructions for using ServeRAID Manager to configure your integrated SCSI controller with RAID capabilities.

Notes:

1. The integrated SCSI controller with RAID capabilities in your server supports only RAID level-1.
2. If you install a different type of RAID adapter in your server, use the configuration method supplied with the RAID adapter to view or change SCSI settings for attached devices.

Configuring the Gigabit Ethernet controller

Two Ethernet controllers are integrated on the system board. These controllers provide an interface for connecting to 10-Mbps, 100-Mbps, or 1000-Mbps networks and provide full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN). You do not need to set any jumpers or configure the controllers for your operating system before you use the Ethernet controllers. However, you must install a device driver to enable your operating system to address the Ethernet controllers. The device drivers are provided on the *ServerGuide Setup and Installation* CD.

If the Ethernet ports in your server support auto-negotiation, the Ethernet controllers detect the data-transfer rate on the network (10BASE-T, 100BASE-TX, or 1000BASE-T) and automatically operate at that rate, in full-duplex mode or half-duplex mode, as appropriate.

For information about configuring your Ethernet controllers, see the *Broadcom NetXtreme Gigabit Ethernet Software CD* that comes with your server. For updated information about configuring your Ethernet controllers, go to the IBM Support Web site at http://www.ibm.com/pc/support/ and navigate to the area for your server machine type. From this area, you can download documentation, the most current device drivers for your server, and software that supports advanced networking functions. After downloading, run the downloaded program launch.exe.

The Ethernet controllers support optional modes, such as teaming, priority packets, load balancing, fault tolerance, and virtual LANs, which provide higher performance, security, and throughput for your server. These modes apply to the integrated Ethernet controllers and to the controllers on supported Ethernet adapters.

Updating the integrated system management firmware

To update the integrated system management firmware for the integrated system management processor (ISMP), download the Integrated System Management Firmware Update Utility program for your server from the IBM Support Web site at http://www.ibm.com/pc/support/. Run the Integrated System Management Firmware Update Utility to create a diskette to use to update the firmware. The diskette updates the firmware only and does not affect any device drivers.

Complete the following steps to update the firmware:

1. Turn off the server.
2. Insert the diskette into the diskette drive.
3. Turn on the server. If the server does not start from the diskette, use the Configuration/Setup Utility program to configure the diskette drive as a startup device. (See “Using the Configuration/Setup Utility program” on page 10.) Then, start again at step 1.
4. From the main menu, select **Update System Management Firmware** and press Enter.
5. Follow the instructions on the screen to complete the update.

If there is an error in updating the firmware, try the update again.

Chapter 3. Diagnostics

This section provides basic troubleshooting information to help you resolve some common problems that might occur with your server.

If you cannot locate and correct the problem using the information in this section, see Appendix A, “Getting help and technical assistance”, on page 121 for more information.

General checkout

The server diagnostic programs are stored in upgradeable read-only memory (ROM) on the system board. These programs are the primary method of testing the major components of the server: the system board, Ethernet controller, video controller, RAM, keyboard, mouse (pointing device), diskette drive, serial ports, and hard disk drives. You can also use the diagnostic programs to test some external devices. See “Diagnostic programs and error messages” on page 24.

If you cannot determine whether a problem is caused by the hardware or by the software, you can run the diagnostic programs to confirm that the hardware is working properly.

When you run the diagnostic programs, a single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After the cause of the first error message is corrected, the other error messages might not occur the next time you run the test.

A failed system might be part of a shared DASD cluster (two or more systems sharing one or more external storage devices). Before you run diagnostics, verify that the failing system is not part of a shared DASD cluster.

A system might be part of a cluster if:

- The system is identified as part of a cluster.
- One or more external storage units are attached to the system and at least one of the attached storage units is also attached to another system or unidentifiable source.
- One or more systems are located near the failing system.

If the failing system is suspected to be part of a shared DASD cluster, you can run all diagnostic tests except the diagnostic tests that test the storage unit (DASD residing in the storage unit) or the storage adapter attached to the storage unit.

Notes:

1. For systems that are part of a shared DASD cluster, run one test at a time in looped mode. Do not run all tests in looped mode, because this could enable the DASD diagnostic tests.
2. If multiple error codes are displayed, diagnose the first error code that is displayed.
3. If the computer stops with a POST error, go to “POST error codes” on page 99.
4. If the computer stops and no error is displayed, go to “Undetermined problems” on page 112.
5. For safety information, see “Safety information” on page 123.
6. For intermittent problems, check the error log.

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Checkout procedure

Complete the following steps to perform the checkout procedure:

001 **IS THE SYSTEM PART OF A CLUSTER?**

YES. Schedule maintenance for the system. Shut down all systems related to the cluster. Run the storage test.

NO. Go to step **002** .

002 **IF THE SYSTEM IS NOT PART OF A CLUSTER:**

1. Turn off the server and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Turn on all external devices.
5. Turn on the server.
6. Record any POST error messages that are displayed on the screen. If an error is displayed, look up the first error in the “POST error codes” on page 99.
7. Check the information LED panel System Error LED; if it is on, see “Light Path Diagnostic panel system error LED” on page 86.
8. Check the System Error log. If an error was recorded by the system, see Chapter 6, “Symptom-to-FRU index”, on page 83.
9. Start the diagnostic programs.
10. Check for the following responses:
    - One beep.
    - Readable instructions or the main menu.

003 **DID YOU RECEIVE BOTH OF THE CORRECT RESPONSES?**

NO. Find the failure symptom in Chapter 6, “Symptom-to-FRU index”, on page 83.

YES. Run the diagnostic programs. If necessary, see “Diagnostic programs and error messages” on page 24.

If you receive an error, see Chapter 6, “Symptom-to-FRU index”, on page 83.

If the diagnostic programs were completed successfully and you still suspect a problem, see “Undetermined problems” on page 112.

Diagnostic tools overview

The following tools are available to help you identify and resolve hardware-related problems:

- **POST beep codes, error messages, and error logs**

  The power-on self-test (POST) generates beep codes and messages to indicate successful test completion or the detection of a problem. See “POST error logs” for more information.

  The POST error log contains the three most recent error codes and messages that the system has generated during POST. The System Error log contains all the error messages that were issued during POST.

  To view the contents of the error logs, start the Configuration/Setup Utility program; then, select **Error Logs** from the main menu. See “Viewing the System Error log” on page 25 for more information.

- **Diagnostic programs and error messages**

  The server diagnostic programs are stored in upgradable read-only memory (ROM) on the system board. These programs are the primary method of testing the major components of your server. See “Diagnostic programs and error messages” on page 24 for more information.

- **ServerGuide error symptoms**

  ServerGuide error symptoms are explained at “ServerGuide error symptoms” on page 27.

- **SCSI error messages**

  For information on SCSI errors, see “Small computer system interface messages” on page 27 and “SCSI error codes” on page 108.

- **Light Path Diagnostics™ feature**

  The server has light-emitting diodes (LEDs) to help you identify problems with server components. By following the light path, you can quickly identify the type of problem that occurred. The light path begins with the LEDs on the operator information panel (also known as the front LED panel). See “Light Path Diagnostics” on page 28 for more information.

- **Error symptom charts**

  These charts list problem symptoms, along with suggested steps to correct the problems. See the “Error symptoms” on page 92 for more information.

- **Customized support page**

  You can create a customized support page that is specific to your hardware, complete with Frequently Asked Questions, Parts Information, Technical Hints and Tips, and Downloadable files. In addition, you can choose to receive electronic mail (e-mail) notifications whenever new information becomes available about your registered products.

  After you register and profile your xSeries products, you can diagnose problems using the IBM Online Assistant, and you can participate in the IBM discussion forum. For more detailed information about registering and creating a customized profile for your IBM products, go to the following addresses on the Web:
  – http://www.ibm.com/pc/register
  – http://www.ibm.com/pc/support

POST error logs

When you turn on the server, it performs a series of tests to check the operation of server components and some of the options installed in the server. This series of tests is called the power-on self-test, or POST.

If POST finishes without detecting any problems, a single beep sounds, and the first screen of the operating system or application program appears.

If POST detects a problem, more than one beep sounds, and an error message appears on your screen. See “Beep symptoms” on page 83 and “POST error codes” on page 99 for more information.

Notes:

1. If you have a power-on password or administrator password set, you must type the password and press Enter, when prompted, before POST will continue.
2. A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.

The POST error log contains the three most recent error codes and messages that the system generated during POST. The System Error log contains all messages issued during POST and all system status messages from the service processor.

You can view the contents of the System Error log from the Configuration/Setup Utility program or from the diagnostic programs.

Viewing error logs from the Configuration/Setup Utility program

Start the Configuration/Setup Utility program and select **Error Logs** from the main menu; then, select either **POST Error Log** or **System Event/Error Log**. See “Starting the Configuration/Setup Utility program” on page 10 for more information.

Viewing error logs from the diagnostic programs

Start the diagnostic programs; select **Hardware Info** from the top of the diagnostic programs screen; select **System Error Log** from the list that appears; then, follow the instructions on the screen. See “Starting the diagnostic programs” for more information.

Diagnostic programs and error messages

The server diagnostic programs are stored in upgradeable read-only memory (ROM) on the system board. These programs are the primary method of testing the major components of your server.

Diagnostic error messages indicate that a problem exists; they are not intended to be used to identify a failing part. Troubleshooting and servicing of complex problems that are indicated by error messages should be performed by trained service personnel.

Sometimes the first error to occur causes additional errors. In this case, the server displays more than one error message. Always follow the suggested action instructions for the *first* error message that appears.

Starting the diagnostic programs

Complete the following steps to start the diagnostic programs:

1. Turn on the server and watch the screen.

   Note: To run the diagnostic programs, you must start the server with the highest level password that is set. That is, if an administrator password is

set, you must enter the administrator password, not the power-on password, to run the diagnostic programs.

2. When the message `F2 for Diagnostics` appears, press F2.
3. Type the appropriate password; then, press Enter.
4. Select either **Extended** or **Basic** from the top of the screen.
5. When the Diagnostic Programs screen appears, select the test you want to run from the list that appears; then, follow the instructions on the screen.

   Notes:

   a. You can press F1 while running the diagnostic programs to obtain help information. You also can press F1 from within a help screen to obtain online documentation from which you can select different categories. To exit from the help information and return to where you left off, press Esc.

   b. If the server stops during testing and you cannot continue, restart the server and try running the diagnostic programs again. If the problem remains, replace the component that was being tested when the server stopped.

   c. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the server.

   d. If you run the diagnostic programs with either no mouse or a USB mouse attached to your server, you will not be able to navigate between test categories using the **Next Cat** and **Prev Cat** buttons. All other functions provided by mouse-selectable buttons are also available using the function keys.

   e. You can test the USB keyboard by using the regular keyboard test. The regular mouse test can test a USB mouse. Also, you can run the USB interface test only if there are no USB devices attached.

   f. You can view server configuration information (such as system configuration, memory contents, interrupt request (IRQ) use, direct memory access (DMA) use, device drivers, and so on) by selecting **Hardware Info** from the top of the screen.

If the diagnostic programs do not detect any hardware errors but the problem persists during normal server operations, a software error might be the cause. If you suspect a software problem, see the information that comes with the software package.

Viewing the test log

When the tests are completed, you can view the test log by selecting **Utility** from the top of the screen and then selecting **View Test Log**.

Notes:

1. You can view the test log only while you are in the diagnostic programs. When you exit the diagnostic programs, the test log is cleared (saved test logs are not affected). To save the test log so that you can view it later, click **Save Log** on the diagnostic programs screen and specify a location and name for the saved log file.
2. To save the test log to a diskette, you must use a diskette that you have formatted yourself; this function does not work with preformatted diskettes. If the diskette has sufficient space for the test log, the diskette may contain other data.

Viewing the System Error log

You can also view the System Error log from the diagnostic programs. See the instructions in “POST error logs” on page 23.

Diagnostic error message tables

For descriptions of the error messages that might appear when you run the diagnostic programs, see “Diagnostic error codes” on page 88.

Notes:

1. Depending on your server configuration, some of the error messages might not appear when you run the diagnostic programs.
2. If diagnostic error messages appear that are not listed in the tables, make sure that your server has the latest levels of BIOS, Advanced System Management Processor, ServeRAID, and diagnostics microcode installed.

Error code format

The error code format is as follows:

```
fff-ttt-iii-date-cc-text message
```

where:

fff is the three-digit function code that indicates the function being tested when the error occurred. For example, function code 089 is for the microprocessor.

ttt is the three-digit failure code that indicates the exact test failure that was encountered. (These codes are for trained service personnel; see “Diagnostic error codes” on page 88).

iii is the three-digit device ID. (These codes are for trained service personnel; see “Diagnostic error codes” on page 88).

date is the date that the diagnostic test was run and the error recorded.

cc is the check value that is used to verify the validity of the information.

text message is the diagnostic message that indicates the reason for the problem.

Text message format

The diagnostic text message format is as follows:

```
Function Name: Result (test specific string)
```

where:

Function Name
is the name of the function being tested when the error occurred. This corresponds to the function code (fff) shown in the error code format in the previous section.

Result
can be one of the following:

Passed This result occurs when the diagnostic test is completed without any errors.

Failed This result occurs when the diagnostic test discovers an error.

User Aborted This result occurs when you stop the diagnostic test before it is complete.

Not Applicable	This result occurs when you specify a diagnostic test for a device that is not present.
Aborted	This result occurs when the test could not proceed, for example, because of the system configuration.
Warning	This result occurs when a possible problem is reported during the diagnostic test, such as when a device driver is not found.

test specific string
is additional information that you can use to analyze the problem.

ServerGuide error symptoms

Look for the symptom in the left column of the chart. Probable solutions to the problem are in the right column.

Table 3. ServerGuide Setup and Installation CD

Symptom	Suggested action
The *ServerGuide Setup and Installation* CD will not start.	• Ensure that the server is supported and has a startable (bootable) CD-ROM drive. • If the startup (boot) sequence settings have been altered, ensure that the CD-ROM drive is first in the startup sequence. • If more than one CD-ROM drive is installed, ensure that only one drive is set as the primary drive. Start the CD from the primary drive.
The SCSI RAID program cannot view all installed drives, or the NOS cannot be installed.	• Ensure that there are no duplicate SCSI IDs or IRQ assignments. • Ensure that the hard disk drive is connected properly.
The Operating System Installation program continuously loops.	Make more space available on the hard disk.
The ServerGuide program will not start your NOS CD.	Ensure that the NOS CD you have is supported by the ServerGuide program. See the *ServerGuide Setup and Installation* CD label for a list of supported NOS versions.
The NOS cannot be installed; the option is not available.	Ensure that the NOS is supported on your server. If the NOS is supported, either there is no logical drive defined (SCSI RAID systems) or the ServerGuide System Partition is not present. Run the ServerGuide program, and ensure that setup is complete.

Small computer system interface messages

If you receive a SCSI error message, see “SCSI error codes” on page 108.

Note: If your server does not have a hard disk drive, ignore any message that indicates that the BIOS is not installed.

Light Path Diagnostics

The Light Path Diagnostics LEDs help you to identify problems with server components. By following the light path, you can quickly identify and fix the type of problem that occurred. The light path begins with the LEDs on the front panel of the server. If the server encounters a problem, it lights either the Information LED or the Error LED.

To isolate the source of a problem, remove the server from the rack, remove the top cover and examine the level 2 Light Path Diagnostics LEDs on the system board (see “Level 2 diagnostic panel LEDs”). These LEDs can indicate a problem with a single component, or a problem with one of several similar components. In the latter case, to isolate the specific failing component, look for a lit LED on the system board or next to a component.

For example, if the level 2 FAN LED is lit, the specific failing fan is indicated by an LED next to the fan. If the MEM LED is lit, the specific failing DIMM is indicated by an LED next to the DIMM.

The level 2 diagnostic LED panel is located on the system board. If you press the Light Path button (SW1, next to the NON OPT LED), the Circuit OK LED (CR82, next to the TEMP LED) will illuminate. This shows that the diagnostic circuitry is working correctly.

The server is designed so that any LEDs that are illuminated can be illuminated again without ac power after you remove the cover. This feature helps you isolate the problem if an error causes the server to shut down. See “Light Path Diagnostic panel system error LED” on page 86.

Important: You have up to 12 hours to use the Light Path Diagnostic LEDs after ac power has been removed from the server. After 12 hours, you must power-on the server again to be able to use the Light Path Diagnostic LEDs to help locate system errors.

To view the LEDs on the system board:

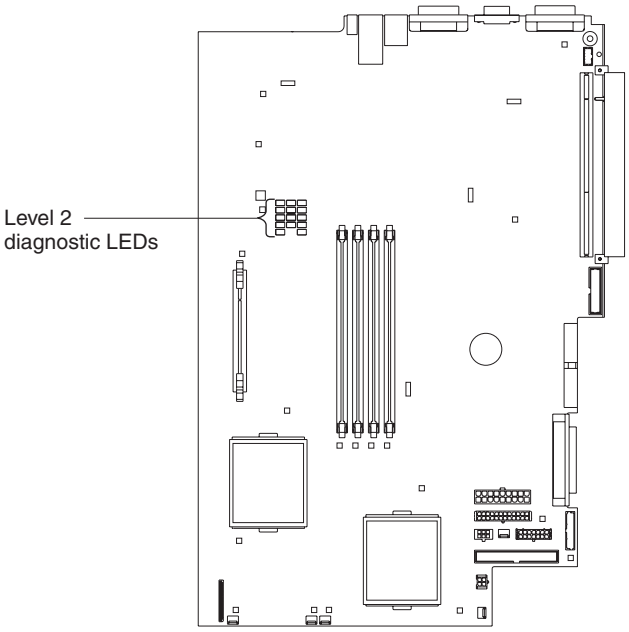
1. Turn off the server and peripheral devices.
2. Remove all external cables from the server; then, remove the server from the rack and remove the cover (see “Removing the cover and bezel” on page 46).
3. Press and hold the Light Path Diagnostics (blue) button on the system board at the right front of the LED cluster. The error-indicating LEDs will light while the switch is pressed. Take corrective action for the indicated error (see “Light Path Diagnostic panel system error LED” on page 86).

   Note: You can light the LEDs for a maximum of two minutes. After that time, the circuit that powers the LEDs is exhausted.
4. Replace the cover on the server (see “Installing the cover and bezel” on page 62); then, reinstall the server in the rack and connect all external cables.

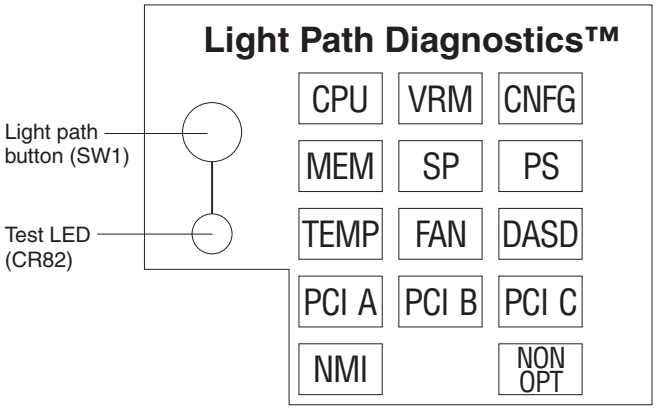
Level 2 diagnostic panel LEDs

The Light Path Diagnostics feature might direct you to look for an LED on the system board that identifies the specific failing component. The following illustration

shows the location of the level 2 diagnostic LED panel on the system board.



The following illustration shows the error LEDs, light path button, and test LED on Light Path Diagnostics panel on the system board. See “Light Path Diagnostic panel system error LED” on page 86 for information on identifying problems using these LEDs.



If you remove the server from the rack and you are using the Light Path Diagnostics LEDs to diagnose a problem, you can press the Light Path button to light any LEDs that were lit before you unplugged the server.

Recovering the BIOS code

If the BIOS code has become damaged, such as from a power failure during a flash update, you can recover the BIOS code using the flash ROM page swap jumper (J38) and a BIOS flash diskette.

Note: Use one of the following methods to obtain a BIOS flash diskette:

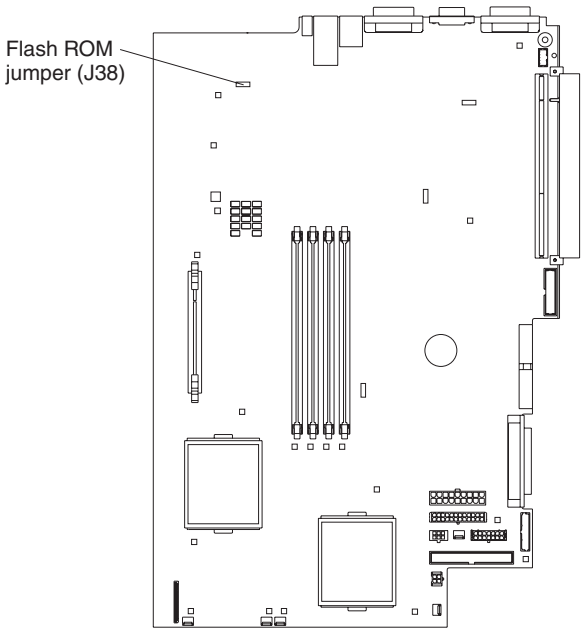
- Use the ServerGuide program to make a BIOS flash diskette.
- Download a BIOS flash diskette from the World Wide Web at http://www.ibm.com/pc/support.

- Contact your IBM service representative.

The flash memory of the server consists of a primary page and a backup page. The J38 jumper controls which page is used to start the server. If the BIOS code in the primary page is damaged, you can use the backup page to start the server; then, start the BIOS flash diskette to restore the BIOS code to the primary page.

Complete the following steps to recover the BIOS code:

1. Turn off the server and peripheral devices and disconnect all power cords and external cables; then, remove the cover.
2. Locate jumper J38 (flash-ROM page swap) on the system board.



3. Move the jumper to pins 2 and 3 to enable BIOS recovery mode.
4. Reconnect all external cables and power cords and turn on the peripheral devices.
5. Insert the BIOS flash diskette into the diskette drive and restart the server. The system begins the power-on self-test (POST).
6. The Flash Update Utility program displays the Flash Update Menu. Select **1 - Update POST/BIOS**.
7. When prompted as to whether you want to save the current code to a diskette, press N.
8. When prompted to choose a language, select a language (from 0 to 7) and press Enter to accept your choice.
9. **Attention:** Do *not* restart the server at this time.
   Remove the flash diskette from the diskette drive.
10. Turn off the server.
11. Move the jumper on J38 to pins 1 and 2 to return to normal startup mode.
12. Replace the cover and restart the server. The system should start up normally.

Power checkout

Power problems can be difficult to solve. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually a short circuit will cause the power subsystem to shut down because of an overcurrent condition.

A general procedure for troubleshooting power problems is as follows:

1. Turn off the server and disconnect all ac power cords.
2. Check for loose cables in the power subsystem. Also check for short circuits, for example, if there is a loose screw causing a short circuit on a circuit board.
3. Remove adapters and disconnect the cables and power connectors to all internal and external devices until the server is at the minimum configuration required to start the server (see “Minimum operating requirements” on page 112).
4. Reconnect all ac power cords and turn on the server. If the server starts up successfully, replace adapters and devices one at a time until the problem is isolated. If the server does not start up from the minimal configuration, replace FRUs of minimal configuration one at a time until the problem is isolated.

To use this method, it is important to know the minimum configuration required for a system to start (see page 112).

Troubleshooting the Ethernet controller

This section provides troubleshooting information for problems that might occur with the 10/100/1000 Mbps Ethernet controller.

Ethernet plug wrap test

The way the Ethernet controller is tested depends on which operating system you are using (see the Ethernet controller device driver README file).

You can use the Ethernet wrap test to determine if a hardware problem is causing the Ethernet connection to fail. To perform the Ethernet wrap test, use the wrap plug (FRU 60G3981) with the diagnostic tests.

If this testing method indicates that the hardware is functioning normally but the problem still exists, see “Network connection problems” or inform the network administrator.

Network connection problems

If the Ethernet controller cannot connect to the network, check the following conditions:

- Make sure that the cable is installed correctly.

  The network cable must be securely attached at all connections. If the cable is attached but the problem remains, try a different cable.

  If you set the Ethernet controller to operate at either 100 Mbps or 1000 Mbps, you must use Category 5 or higher cabling.
- Determine whether the hub supports auto-negotiation. If it does not, try configuring the integrated Ethernet controller manually to match the speed and duplex mode of the hub.
- Check the Ethernet controller LEDs on the rear of the server.

The Ethernet link status LED, on the rear of the server, is lit when the Ethernet controller receives a LINK pulse from the hub. If the LED is off, there might be a defective connector or cable or a problem with the hub.

- Make sure that you are using the correct device drivers which are supplied with your server.
- Check for operating-system-specific causes for the problem.
- Make sure that the device drivers on the client and server are using the same protocol.

Ethernet controller troubleshooting chart

Use the following troubleshooting chart to find solutions to 10/100/1000 Mbps Ethernet controller problems that have definite symptoms.

Table 4. Ethernet troubleshooting chart

Ethernet controller problem	**FRU/actions**
The server stops running when loading device drivers.	The PCI BIOS interrupt settings are incorrect. Check the following: • Determine if the interrupt (IRQ) setting assigned to the Ethernet controller is also assigned to another device in the Configuration/Setup Utility program. Although interrupt sharing is allowed for PCI devices, some devices do not function well when they share an interrupt with a dissimilar PCI device. Try changing the IRQ assigned to the Ethernet controller or the other device. For example, for NetWare Versions 3 and 4, it is recommended that disk controllers not share interrupts with LAN controllers. • Make sure that you are using the most recent device driver available from the World Wide Web. • Run the network diagnostic program. • Reseat or replace the adapter.
Ethernet link status LED does not work.	Check the following: • Make sure that the hub is turned on. • Check all connections at the Ethernet controller and the hub. • Use another port on the hub. • If the hub does not support auto-negotiation, manually configure the Ethernet controller to match the hub. • If you manually configured the Duplex mode, make sure that you also manually configure the speed. • Run diagnostics on the LEDs. • Reseat or replace the adapter.
Data is incorrect or sporadic.	Check the following: • Make sure that you are using Category 5 or higher cabling when operating the server at 100 Mbps or at 1000 Mbps. • Make sure that the cables do not run close to noise-inducing sources like fluorescent lights.
The Ethernet controller stopped working when another adapter was added to the server.	Check the following: • Make sure that the cable is connected to the Ethernet controller. • Make sure that your PCI system BIOS code is current. • Reseat the adapter. • Determine if the interrupt (IRQ) setting assigned to the Ethernet adapter is also assigned to another device in the system. Use the Configuration/Setup Utility program to determine if this is the case. Although interrupt sharing is allowed for PCI devices, some devices do not function well when they share an interrupt with a dissimilar PCI device. Try changing the IRQ assigned to the Ethernet adapter or the other device. • Reseat or replace the adapter.

Table 4. Ethernet troubleshooting chart (continued)

Ethernet controller problem	FRU/actions
The Ethernet controller stopped working without apparent cause.	Check the following: • Run diagnostics for the Ethernet controller. • Try a different connector on the hub. • Reinstall the device drivers. See your operating-system documentation and the ServerGuide information. • Reseat or replace the adapter.

Ethernet controller messages

The integrated Ethernet controller might display messages from certain device drivers. The information in this section might be helpful. The latest information available concerning these messages will be made available at the IBM Support Web site at http://www.ibm.com/pc/support.

Note: Although the term ″adapter″ is used in these messages, the messages might also apply to the integrated Ethernet controller on the system board.

Novell NetWare or IntraNetWare system ODI driver messages

This section explains the error messages for the Novell NetWare or IntraNetWare system ODI driver, and suggested actions to resolve each problem.

Table 5. NetWare or IntraNetWare system ODI driver teaming messages for the Ethernet controller

Message	Description
Could not allocate resources.	**Explanation:** An unknown error has occurred when trying to allocate needed resources for the AFT Module. **Action:** • Check the system configuration. If the problem remains, contact the network supplier. • Verify that the Ethernet controller is enabled. If the Ethernet controller is enabled, run the diagnostic programs.
AFT group for primary adapter in slot *nnn* already exists.	**Explanation:** An attempt was made to rebind an adapter already in an AFT group. **Action:** Check the AFT slot numbers for existing AFT teams. If the problem remains, contact the network supplier.
Error locating device control table (DCT) addresses in internal table. Make sure that you have loaded LAN drivers after loading AFT.NLM.	**Explanation:** The bind command was entered prior to loading the device driver. The device driver must be loaded after loading AFT.NLM, but before any bind command can be issued. **Action:** Load the driver for the supported adapter and try loading the AFT module again. If the problem remains, contact the network supplier.
Insufficient number of arguments specified.	**Explanation:** The appropriate or expected number of parameters was not entered in a command. **Action:** Check the parameters required for the given command. If the problem remains, contact the network supplier.
Duplicate slot numbers detected.	**Explanation:** An attempt has been made to bind the same slot number more than once. **Action:** Check the slot numbers entered during the bind. Adapter slot numbers must be valid and unique. If the problem remains, contact the network supplier.

Table 5. NetWare or IntraNetWare system ODI driver teaming messages for the Ethernet controller (continued)

Message	Description
'*xxx*' is not supported for AFT team.	**Explanation:** A bind command has been issued for adapters not supported by AFT.NLM. **Action:** Make sure that you attempt to bind only adapters supported by AFT.NLM.
Primary and Secondary adapters do not match. AFT group is not created.	**Explanation:** A bind command was entered for an adapter team that is a combination of system and client adapters. An AFT team must be a grouping of the same classification of adapter. **Action:** Verify that all the adapters bound in a team are of the same classification.
Requested number of Secondary cards are not found.	**Explanation:** The number of adapters specified in the bind command could not be located. **Action:** Verify the numbers and slot locations of the adapters to be bound. If the problem remains, contact the network supplier.
Failed to create AFT group. Make sure that the drivers for supported adapters are loaded, primary adapter is bound to protocols, and secondary adapter is not bound to any protocols.	**Explanation:** Binding of protocol failed. Protocol is either not bound to any adapter or is bound to more than one adapter in the group. **Action:** Ensure that the protocol is bound to only one adapter in an AFT team.
Error identifying slot numbers for the specified board names.	**Explanation:** The mapping between the board name entered and the slot number for an adapter could not be established. **Action:** Check the board name for the adapter before issuing the bind command. If the problem remains, contact the network supplier.
Cannot unbind specified slot from AFT group. Make sure that the slot you specified is for the primary adapter in an AFT group.	**Explanation:** The number entered in the unbind command was not the primary adapter in an AFT group. **Action:** Reissue the unbind command and specify the slot number for the primary adapter.
LAN adapter at slot *nnnn* (Port 0x*aa*) failed to reset. Check the state of the adapter.	**Explanation:** The adapter that you specified could not be initialized. **Action:** 1. Load the driver for the supported adapter. 2. Check that the adapter is seated properly in the slot and try loading the AFT module again. If the problem remains, contact the network supplier.
AFT is not supported on this version of NetWare.	**Explanation:** The NetWare on the server is not a version supported by AFT. **Action:** Load and bind AFT only on supported versions of NetWare (currently version 5.1 and above).
Failed to allocate resources tags.	**Explanation:** An unknown error has occurred when trying to allocate needed resources for the AFT module. **Action:** Check system configuration. If the problem remains, contact the network supplier.
Please unload all LAN drivers before unloading AFT.NLM.	**Explanation:** An attempt was made to unload the AFT.NLM module before unloading the adapter driver. **Action:** Unload the adapter driver before unloading the AFT module.

NDIS 4.0 (Windows NT) driver messages

This section explains the error messages for the NDIS drivers. The explanation and recommended action are included with each message.

Note: Although the term ″adapter″ is used in these messages, the messages might also apply to the integrated Ethernet controller on the system board.

Table 6. NDIS (Windows NT®) driver messages for the Ethernet controller

Error code (hex)	Description
0x00	**Explanation:** The driver could not register the specified interrupt. **Action:** Using the Configuration/Setup Utility program, make sure that a PCI interrupt is assigned to the Ethernet card, and that Ethernet is enabled.
0x01	**Explanation:** One of the PCI/PCI-X cards did not get the required resources. **Action:** Using the Configuration/Setup Utility program, make sure that a PCI interrupt is assigned to the Ethernet card, and that Ethernet is enabled.
0x02	**Explanation:** Bad node address (multicast address). **Action:** Make sure the locally administered address is valid, if one is specified. The address cannot be a multicast address.
0x03	**Explanation:** Failed self-test. **Action:** Make sure a cable is attached to the Ethernet connector.
0x0D	**Explanation:** Could not allocate enough memory for transmit queues. For Windows NT: **Action:** 1. From the Windows NT desktop, click **Start Æ Control Panel Æ Networks Æ Adapters**. 2. Select an IBM Ethernet adapter from the list. 3. Click **Properties Æ Advanced**. 4. Lower the resource values that apply to the transmit queue. For Windows 2000®: **Action:** 1. From the Windows 2000 desktop, click **Start Æ Settings Æ Control Panel Æ Network and Dial-up Connections**. 2. Right-click an IBM Ethernet adapter in the list and click **Properties**. 3. Select a component and click **Configure**. 4. Click the **Advanced** tab and lower the resource values that apply to the transmit queue.

Table 6. NDIS (Windows NT®) driver messages for the Ethernet controller (continued)

Error code (hex)	Description
0x0E	**Explanation:** Could not allocate enough memory for receive queue. For Windows NT: **Action:** 1. From the Windows NT desktop, click **Start Æ Control Panel Æ Networks Æ Adapters**. 2. Select an IBM Ethernet adapter from the list. 3. Click **Properties Æ Advanced**. 4. Lower the value for the resource named in the message. For Windows 2000: **Action:** 1. From the Windows 2000 desktop, click **Start Æ Settings Æ Control Panel Æ Network and Dial-up Connections**. 2. Right-click an IBM Ethernet adapter in the list and click **Properties**. 3. Select a component and click **Configure**. 4. Click the **Advanced** tab and lower the value for the resource named in the message.
0x0F	**Explanation:** Could not allocate enough memory for other structures. For Windows NT: **Action:** 1. From the Windows NT desktop, click **Start Æ Control Panel Æ Networks Æ Adapters**. 2. Select an IBM Ethernet adapter from the list. 3. Click **Properties Æ Advanced**. 4. Lower the resource values that apply to the transmit queue. For Windows 2000: **Action:** 1. From the Windows 2000 desktop, click **Start Æ Settings Æ Control Panel Æ Network and Dial-up Connections**. 2. Right-click an IBM Ethernet adapter in the list and click **Properties**. 3. Select a component and click **Configure**. 4. Click the **Advanced** tab and lower the resource values that apply to the transmit queue.
0x10	**Explanation:** Did not find any Ethernet controllers. **Action:** Using the Configuration/Setup Utility program, make sure that Ethernet is enabled.
0x11	**Explanation:** Multiple Ethernet controllers found, but none matched the required ID. **Action:** Using the Configuration/Setup Utility program, make sure that Ethernet is enabled.
0x13	**Explanation:** Did not find any Ethernet controllers that matched the required subven/subdev. **Action:** Using the Configuration/Setup Utility program, make sure that Ethernet is enabled.
0x16	**Explanation:** Single adapter found, but multiple instances tried to load. **Action:** Using the Configuration/Setup Utility program, make sure that Ethernet is enabled, and that the integrated 10/100 Ethernet controller or the optional Ethernet PCI adapter are enabled.
0x17	**Explanation:** Slot parameter not specified in the registry. **Action:** Remove the adapter driver and reinstall it.

Table 6. NDIS (Windows NT®) driver messages for the Ethernet controller (continued)

Error code (hex)	Description
All other 4-character hexadecimal codes	**Action:** See supplementary documentation, such as www.ibm.com/pc/support, for more information.

Ethernet Windows NDIS teaming messages

This section explains the the messages associated with Ethernet teaming.

Table 7. NDIS Windows driver teaming messages for the Ethernet controller

Event ID	Type	Description
01	Error	**Explanation:** Team name and physical adapter name are the same. This is an invalid configuration. **Action:** Reconfigure the adapter team by double-clicking the **PROSet** icon in the Control Panel.
02	Error	**Explanation:** Unable to allocate required resources. **Action:** Free some memory resources and restart.
03	Error	**Explanation:** Unable to read required registry parameters. **Action:** Reconfigure the adapter team by double-clicking the **PROSet** icon in the Control Panel.
04	Error	**Explanation:** Unable to bind to physical adapter. **Action:** Reconfigure the adapter team by double-clicking the **PROSet** icon in the Control Panel.
05	Error	**Explanation:** Unable to initialize an adapter team **Action:** Reconfigure the adapter team by double-clicking the **PROSet** icon in the Control Panel.
06	Informational	**Explanation:** Team *nn*. Primary adapter is initialized. **Action:** None.
07	Informational	**Explanation:** Team *nn*. Secondary adapter is initialized. **Action:** None.
08	Informational	**Explanation:** Team *nn*. Virtual adapter or Team is initialized. **Action:** None.
09	Informational	**Explanation:** Team *nn*. Primary adapter is switching over. **Action:** None.
10	Warning	**Explanation:** Team *nn*. Adapter link down. **Action:** Make sure the adapter is functioning properly.
11	Informational	**Explanation:** Team *nn*. Secondary adapter took over. **Action:** None.
12	Warning	**Explanation:** Team *nn*. Secondary adapter is deactivated from the Team. **Action:** Make sure the secondary adapter is functioning properly and that the adapter cable is securely connected to the LAN.

Table 7. NDIS Windows driver teaming messages for the Ethernet controller (continued)

Event ID	Type	Description
13	Informational	**Explanation:** Team *nn*. Secondary adapter has rejoined the Team. **Action:** None.
14	Informational	**Explanation:** Team *nn*. Secondary adapter link is up. **Action:** None.
15	Error	**Explanation:** Team *nn*. The last adapter has lost its link. Network connection has been lost. **Action:** Shut down the server and replace the adapters; then, restart the server to reestablish the connection.
16	Informational	**Explanation:** Team *nn*. An adapter has reestablished the link. Network connection has been restored. **Action:** None.
17	Informational	**Explanation:** Team *nn*. Preferred primary adapter has been detected. **Action:** None.
18	Informational	**Explanation:** Team *nn*. Preferred secondary adapter has been detected. **Action:** None.
19	Informational	**Explanation:** Team *nn*. Preferred primary adapter took over. **Action:** None.
20	Informational	**Explanation:** Team *nn*. Preferred secondary adapter took over. **Action:** None.
21	Warning	**Explanation:** Team *nn*. Primary adapter does not sense any probes. Possible reason: partitioned Team. **Action:** Make sure the cables of the adapter team are connected to the same LAN segment. Reconfigure the team if necessary.

Chapter 4. Customer replaceable units

This chapter provides instructions for installing, removing, and connecting optional devices that the server supports.

Installation guidelines

Before you begin to install options in your server, read the following information:

- Become familiar with the safety and handling guidelines at “Safety information” on page 123, including those specified under “Handling electrostatic discharge-sensitive devices” on page 126.
- Make sure that you have an adequate number of properly grounded electrical outlets for your server, monitor, and other devices that you will connect to the server.
- Back up all important data before you make changes to disk drives.
- Have a small Phillips screwdriver available.
- For a list of supported options for your server, go to http://www.ibm.com/pc/compat/ on the World Wide Web.
- The orange color on components and labels in your server identifies hot-swap or hot-plug component. You can install or remove hot-swap and hot-plug components while the system is running, provided that your system is configured to support this function. For complete details about installing or removing a hot-swap or hot-plug component, see the detailed information in this chapter.
- The blue color on components and labels identifies touch points where you can grip a component, move a latch, and so on.

System reliability considerations

To help ensure proper system cooling and system reliability, make sure that:

- Each of the drive bays has a drive or a filler panel and electromagnetic compatibility (EMC) shield installed in it.
- Space is available around the server to allow the server cooling system to work properly. See the documentation that comes with the rack.
- You have followed the cabling instructions that come with optional adapters.
- You have replaced a failed fan as soon as possible.

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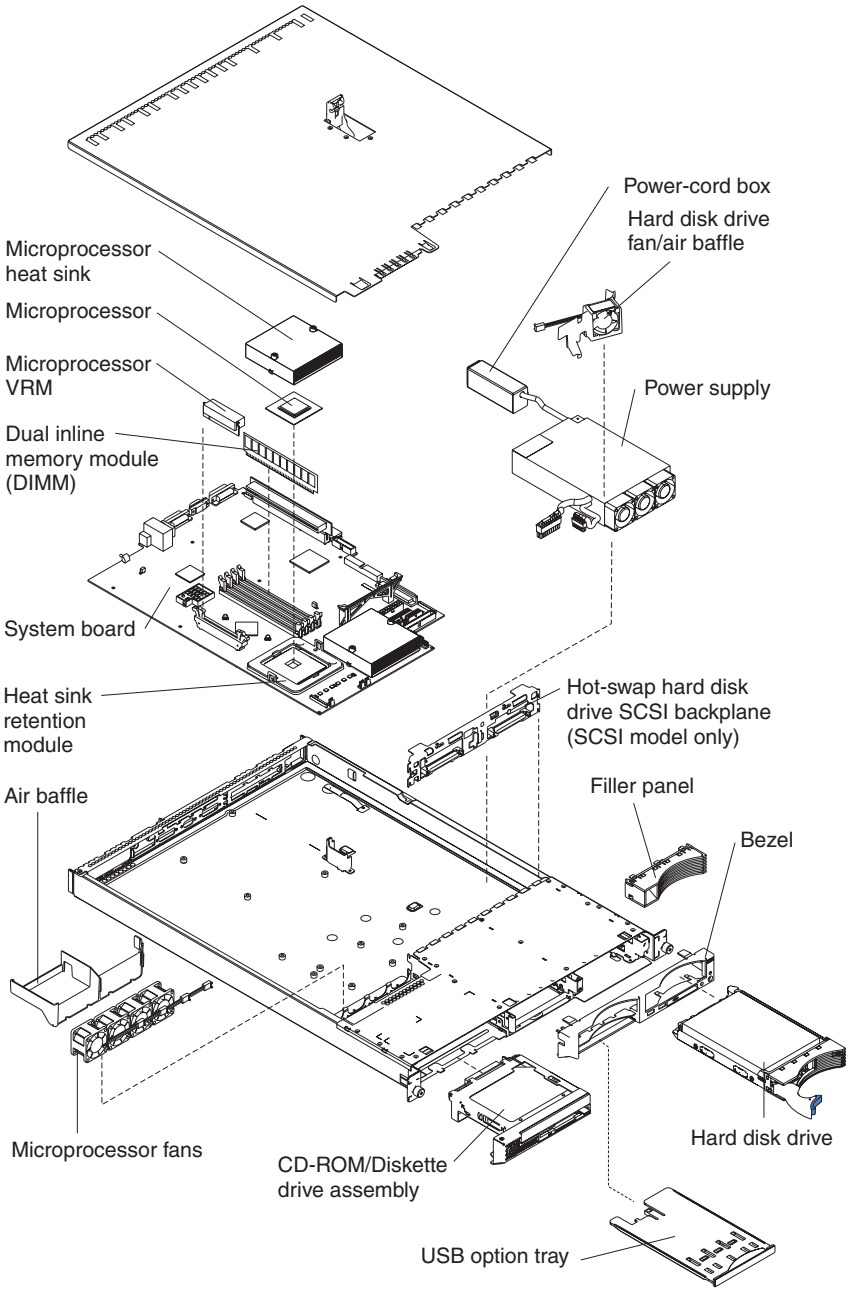
Major components of the xSeries 335 Type 8676 and Type 8830 server

The following illustration shows the major components in the server. It shows a SCSI hot-swap hard disk drive model. An IDE non-hot-swap hard disk drive model is also available. The illustrations in this publication might differ slightly from your hardware.

Note: For more detailed information about replaceable components, see Chapter 7, "Parts listing for the xSeries 335", on page 115 and "System" on page 116.

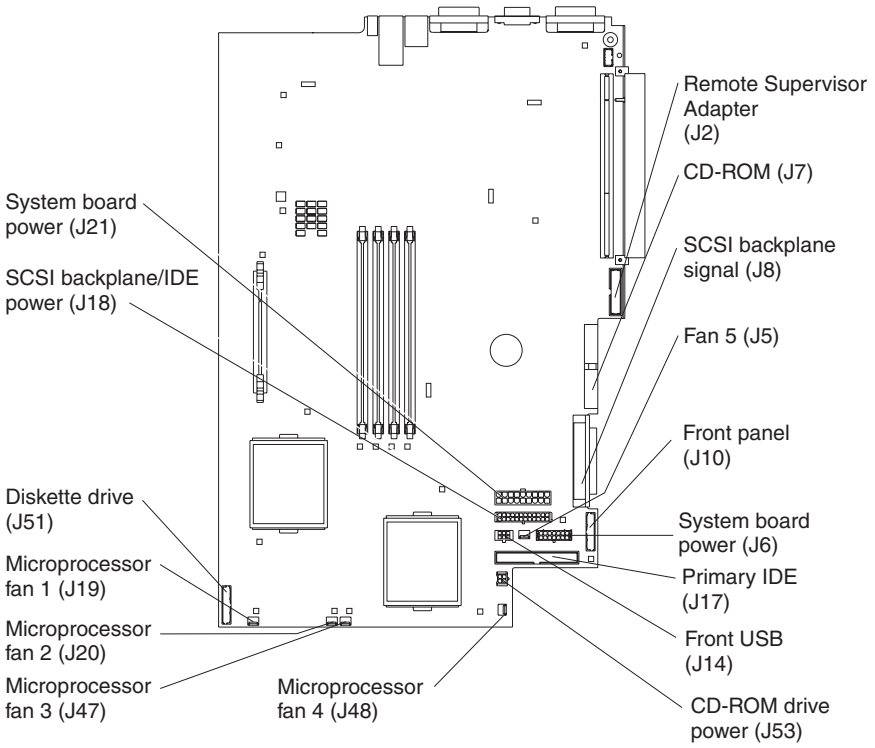


System-board component locations

This section provides illustrations of the system board showing the locations of connectors, switch and jumper blocks, and LEDs.

System-board internal connectors

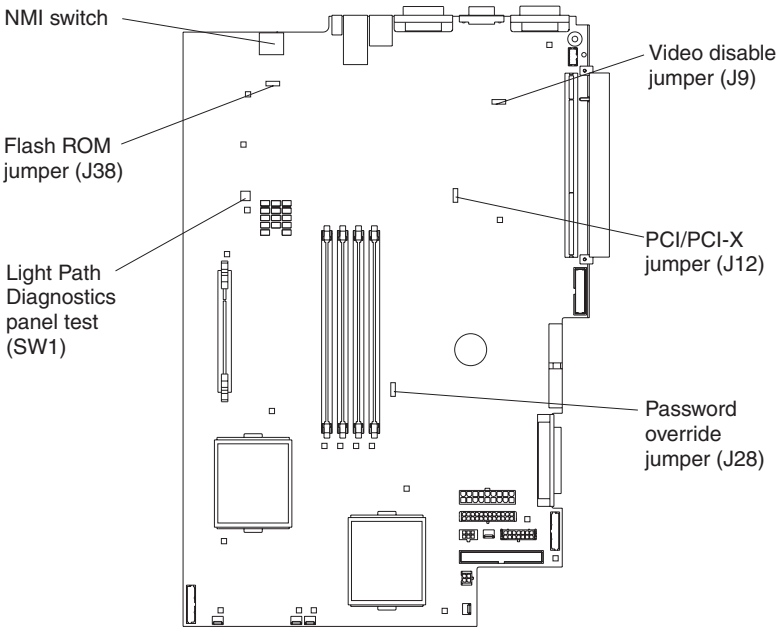
The following illustration shows the internal connectors on the system board.



System-board switches and jumpers

The following illustration shows the location of the switches and jumper blocks on the system board.

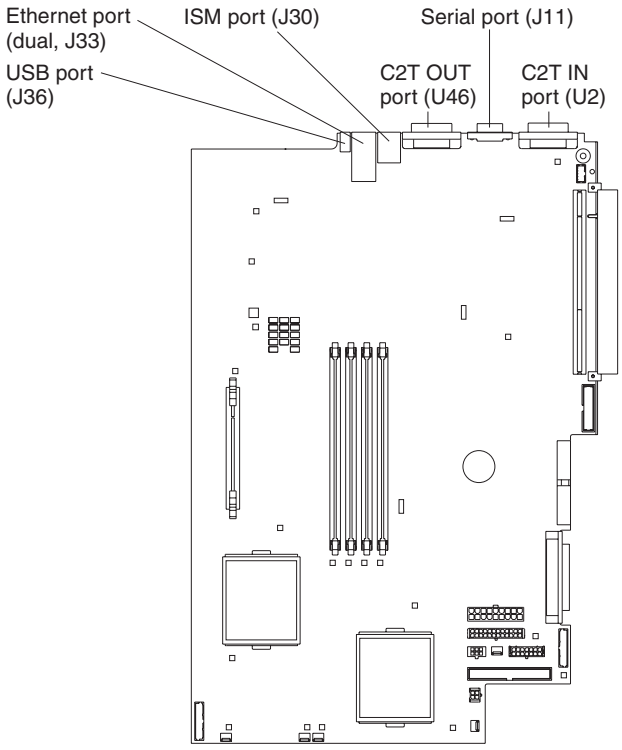
Any jumper blocks on the system board that are not shown in the illustration are reserved. See “Recovering the BIOS code” on page 29 for information about the flash ROM page-swap jumper.



Note: The PCI/PCI-X jumper (J12) is used to manually switch PCI-X slot 1 between PCI-X bus B and PCI bus C.

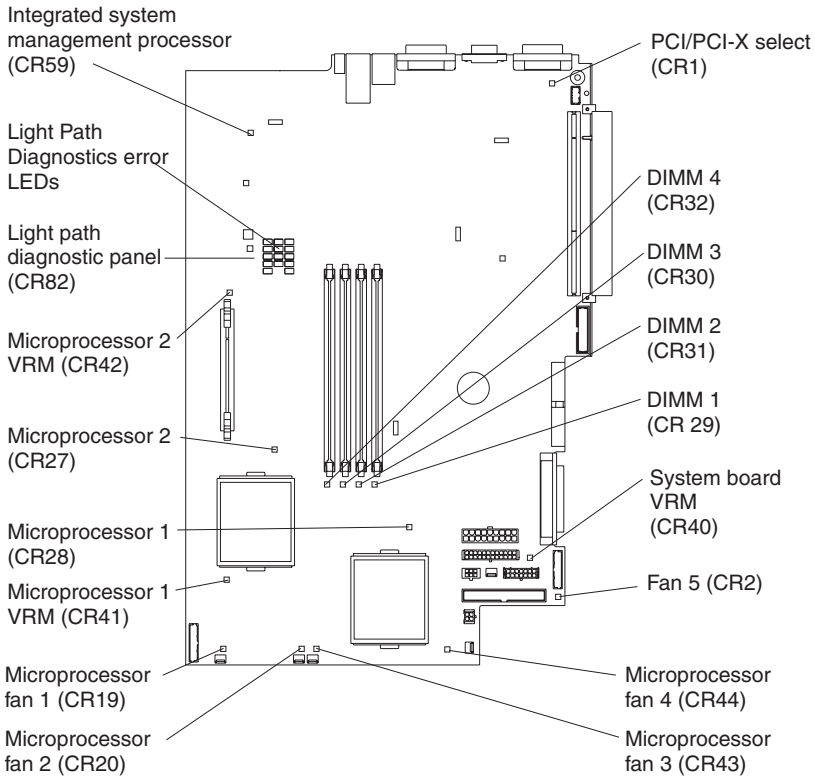
System-board external connectors

The following illustration shows the external input/output connectors on the system board.



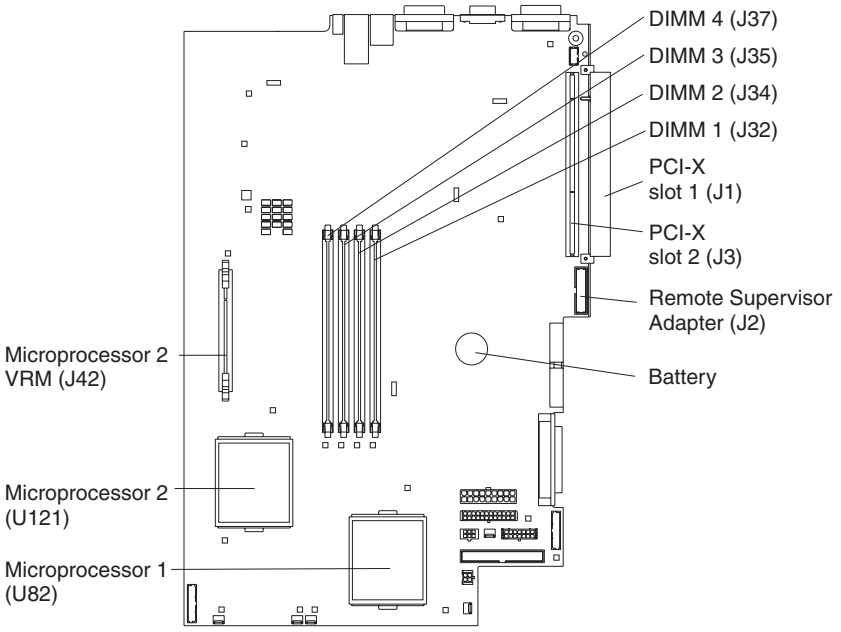
System-board LEDs

The following illustration shows the light-emitting diodes (LEDs) on the system board.



System-board option connectors

The following illustration shows the connectors on the system board for user-installable options.

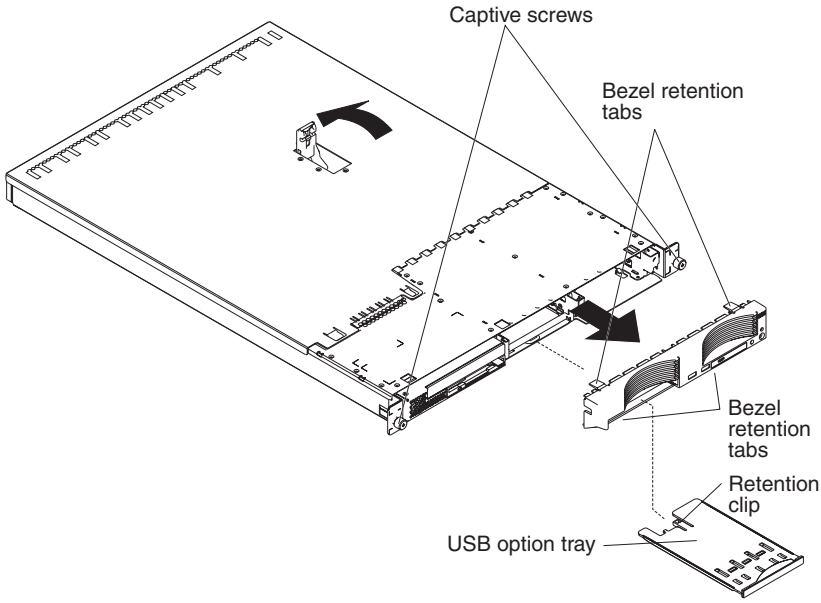


Note: The VRM for microprocessor 1 is integrated into the system board.

Removing the cover and bezel

Complete the following steps to remove the server cover and bezel:

1. Read “Safety information” on page 123 and “Installation guidelines” on page 39.
2. Turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server from the rack.
4. Lift the cover release latch. The cover slides to the rear approximately 13 mm (0.5 inch).



5. Slide the cover back, and lift the cover off the server.

   Attention: To ensure adequate cooling and airflow, replace the cover before turning on the server. Do not operate the server with the cover removed.
6. Press in on the USB option tray (below hard disk drive bay 1) to release it and slide the tray out until it stops; then, press the retention clip at the bottom rear of the tray and remove the tray from the server.

   Note: You only need to remove the USB option tray and the bezel if you are installing a non-hot-swap hard disk drive. It is not necessary if you are installing other options in the server.
7. Press on the bezel retention tabs on the top, right side and bottom of the server, and pull the bezel directly away from the server.

To reinstall the cover and bezel, see “Installing the cover and bezel” on page 62.

Working with adapters

This section describes how to install an adapter in the server. Before you continue with the adapter-installation procedures, review “Adapter considerations”.

Adapter considerations

- Read the documentation that comes with your operating system.
- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this chapter. If you need to change switch settings or jumper settings on the adapter, follow the instructions that come with the adapter.
- The server comes with two 64-bit 100 MHz peripheral component interconnect-extended (PCI-X) adapter expansion slots on the system board. The server is designed specifically for PCI-X adapter support, but it also supports PCI adapters.
- The expansion slots support both 32-bit and 64-bit adapters. You can install half-length adapters in slot 1. You can install full-length adapters in slot 2.
- The server supports 3.3 V and universal PCI and PCI-X adapters; it does not support 5.0 V-only adapters.
- PCI-X slot 2 and the integrated SCSI controller are on PCI-X bus A (bus 0). The integrated Ethernet controllers are on PCI-X bus B (bus 1). The integrated video controller is on PCI bus C (bus 2). PCI-X slot 1 is switchable between PCI-X bus B and PCI bus C.

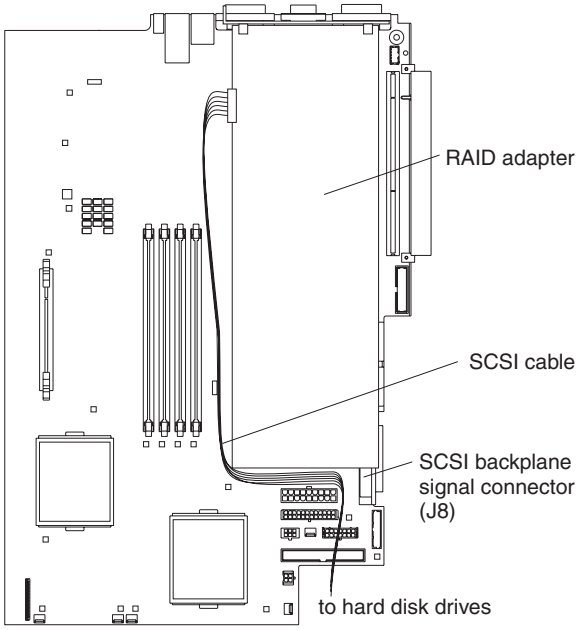
  Note: If no jumper is installed on jumper block J12, the server determines automatically the optimal bus to which to attach PCI-X slot 1. If you install a jumper between pins 1 and 2 on J12, PCI-X slot 1 is forced to PCI bus C. If you install the jumper between pins 2 and 3 on J12, PCI-X slot 1 is forced to PCI-X bus B.

  If you force slot 1 to bus B and you install an adapter that runs at less than 100 MHz in the slot, the integrated Ethernet controllers are forced to run at the slower speed.

  If the PCI/PCI-X LED on the system board (CR1; see “System-board LEDs” on page 44) is on, the slot is operating on bus B; if the LED is not lit, the slot is operating on bus C.
- The server scans PCI-X slots 1 and 2 to assign system resources. By default, the server starts (boots) devices in the following order: system IDE and SCSI devices; then, PCI and PCI-X devices.

  Note: To change the boot precedence for PCI and PCI-X devices you must disable the devices through the Configuration/Setup Utility program. Start the Configuration/Setup Utility program and select **Start Options** from the main menu. Then, select the **Startup Sequence Options** and use the arrow keys to specify the startup order.
- If you plan to install either an optional SCSI adapter or an optional RAID adapter, you can install it in either of the PCI-X slots if the size of the adapter permits. The server supports a variety of RAID adapters for both internal and external configurations. For the most current list of supported RAID adapters, go to http://www.ibm.com/pc/us/compat/ on the World Wide Web. For details about installing a RAID adapter, see the documentation that comes with the adapter.

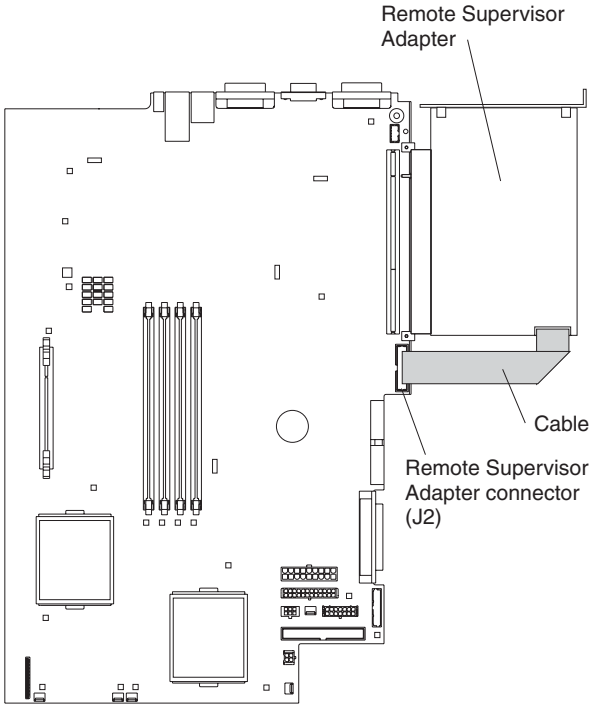
- If you plan to use a RAID adapter to control internal hot-swap hard disk drives, disconnect the SCSI cable from the SCSI backplane signal connector (J8) on the system board and connect it to the RAID adapter. The following illustration shows the cable routing if you are installing the RAID adapter in PCI-X slot 2.



  Note: See the documentation that comes with the RAID adapter for any additional cabling instructions. That documentation also provides information about installing the RAID software and configuring the RAID adapter.

- If you plan to install an optional IBM Remote Supervisor Adapter, install it in PCI-X slot 1. Use the ribbon cable that comes with the Remote Supervisor Adapter to connect the 20-pin connector on the rear edge of the adapter to the Remote Supervisor Adapter connector (J2) on the system board. For details about installing a Remote Supervisor Adapter, see the documentation that comes

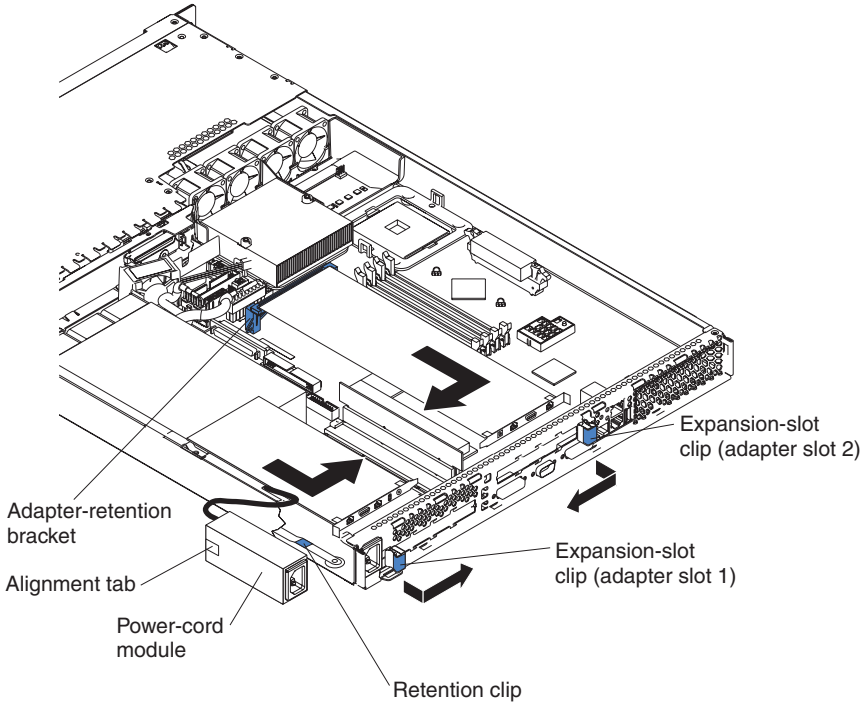
with the adapter. The following illustration shows the cable routing.



Installing an adapter

Complete the following steps to install an adapter:

1. Read “Safety information” on page 123 and “Installation guidelines” on page 39.
2. Turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server from the rack; then, remove the server cover (see “Removing the cover and bezel” on page 46).
4. Determine which PCI-X slot you will use for the adapter.
5. On the rear panel, press the expansion-slot clip together to unlock the clip; then, pull the clip out from the server until it stops. It remains loosely attached to the server.



Attention: Avoid touching the components and gold-edge connectors on the adapter. Ensure that the adapter is completely and correctly seated in the slot. Incomplete insertion might cause damage to the system board or to the adapter.

6. Remove the expansion slot cover from the slot.
7. To gain access to PCI-X slot 1, remove the power-cord module.
   a. Press down on the retention clip at the front of the power-cord module and slide the module toward the front of the server until the alignment tab is free of the slot on the side of the server.
   b. Lift the power-cord module out of the server as far as the power supply cable permits and set it aside.
8. Install the adapter:

   Attention: When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For information about handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 126.

   a. Remove the adapter from the static-protective package and set any jumpers or switches on the adapter as directed by the adapter

manufacturer. If you are installing a full-length adapter, you might have to remove a plastic bracket secured to the adapter with 2 screws before installing the adapter.

Attention: When you install an adapter, ensure that the adapter is correctly seated in the connector before you turn on the server. Improperly seated adapters might cause damage to the system board, the riser card for slot 1, or the adapter.

b. Grasp the adapter by its top edge or upper corners, align it with the connector, and press it *firmly* into the connector.

9. Slide the expansion-slot clip toward the server until it snaps into place.
10. Connect any internal cables to the adapter. See the instructions that come with the adapter for details.

    Attention: Ensure that the cables do not block the flow of air from the fans.
11. If you removed the power-cord module to install the adapter in PCI-X slot 1, install the module by reversing the procedure in step 7a on page 50. Ensure that the alignment tab is fully seated in the slot on the side of the server.
12. If you installed the adapter in PCI-X slot 2, secure the adapter by flexing the adapter-retention latch toward the front of the server and inserting the front corners of the adapter into the recesses in the latch.
13. Perform any configuration tasks required for the adapter.

    Note: If you installed a Remote Supervisor Adapter:

    a. Refer to the documentation provided with the Remote Supervisor Adapter for information about installing the Remote Supervisor Adapter firmware and configuring the adapter.

    b. After you initially configure the adapter, you should create a backup copy of it so that if you need to replace the adapter in the future, you can restore the configuration and resume normal operation more quickly.
14. If you have other options to install, install them now. Otherwise, go to "Completing the installation" on page 62.

Hard disk drives

This section describes how to install a hard disk drive in the server. Before you install a hard disk drive, review the following information:

- The server supports two 25.4-mm (1-inch), slim, 3.5-inch hard disk drives. SCSI models of the server come with a hot-swap SCSI backplane.
- The SCSI server models support low voltage differential (LVD) hot-swap drives. Each hot-swap drive resides in a tray, which has a green activity LED and an amber status LED in the upper-right corner. These LEDs are lit if the drive is active and, in some cases, if the drive fails. Each hot-swap drive has a single-connector-attached (SCA) connector, which plugs directly into the hot-swap SCSI backplane. The backplane attaches to connector J18 on the system board and controls the SCSI IDs for the hot-swap drives.

  Note: The drive in bay 1 is assigned SCSI ID 0; the drive in bay 2 is assigned SCSI ID 1.
- Non-hot-swap disk drives do not require a backplane or tray and they do not have indicator LEDs. However, you must attach the blue rails that come with the drive before installing it in the server.

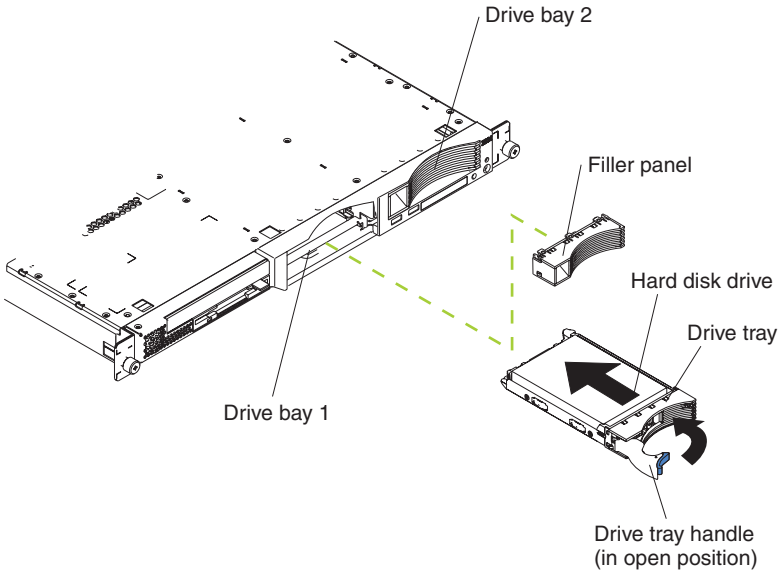
- Non-hot-swap disk drives have a jumper block on the rear. Install a jumper in the cable-selection position of the jumper block. For details, see the notes under step 4 on page 53, and the documentation that comes with the drive.
- If you install only one hard disk drive, for faster startup, install it in the primary boot device bay. For hot-swap SCSI drives, the drive in bay 1 is the primary boot device. For IDE drives, the drive in bay 2 is the primary boot device.
- If you are installing a hot-swap drive, continue with “Installing a hot-swap hard disk drive”. If you are installing a non-hot-swap drive, go to “Installing a non-hot-swap hard disk drive”.

Installing a hot-swap hard disk drive

Before you install a hot-swap hard disk drive, review the following information:

- Inspect the drive tray for any signs of damage.
- Ensure that the drive is installed in the tray correctly.
- If your server has an optional RAID adapter installed, see the documentation provided with the adapter for information about installing a hard disk drive.

Complete the following steps to install a hot-swap SCSI hard disk drive:



1. Read “Safety information” on page 123 and “Installation guidelines” on page 39.
2. Remove the filler panel from the appropriate drive bay.

   Note: To ensure adequate system cooling, do not operate the server for more than two minutes without either a hard disk drive or a filler panel installed in each bay.
3. Install the new hard disk drive in the drive bay.
4. Check the hard disk drive status LED and activity LED to verify that the drive is operating correctly.
5. If you have other options to install, install them now. Otherwise, go to “Completing the installation” on page 62.

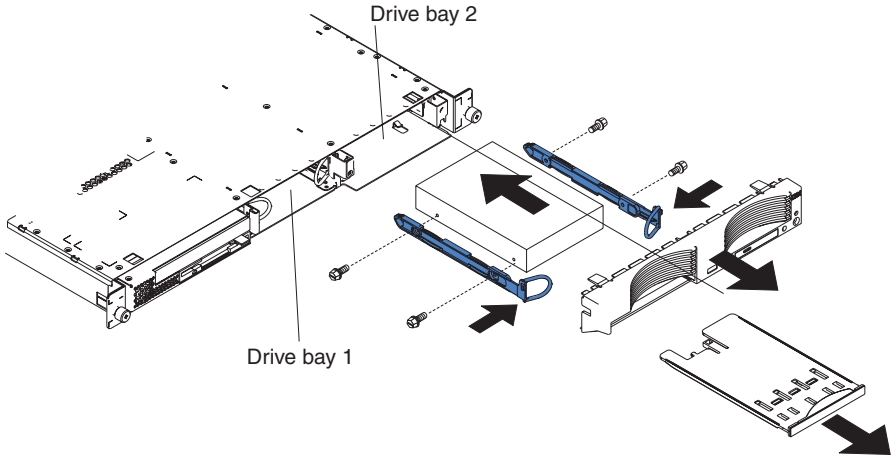
Installing a non-hot-swap hard disk drive

Before you install a non-hot-swap hard disk drive, review the following information:

- See the documentation that comes with the drive for any cabling instructions.

- Route the cable *before* you install the drive. Do not block the airflow from the fans.

Complete the following steps to install a non-hot-swap hard disk drive:



1. Read “Safety information” on page 123 and “Installation guidelines” on page 39.
2. Turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server cover (see “Removing the cover and bezel” on page 46).
4. Press in on the USB option tray to release it and slide the tray out until it stops; then, press the retention clip at the bottom rear of the tray and remove the tray from the server. Press on the bezel retention tabs and pull the bezel directly away from the server.

   Notes:

   a. If you have only one non-hot-swap hard disk drive, install it in the right-hand bay (bay 2) with a jumper installed in the cable-selection-enabled position of the jumper block on the rear of the drive.

   b. If you have two drives and you want the server to determine the master drive and subordinate drive automatically, install jumpers in the cable-selection-enabled position of the jumper block on both drives.

   c. If you want to assign master and subordinate drives manually, install a jumper in the master position for the drive in bay 2 and install a jumper in the subordinate position for the drive in bay 1.
5. Install the hard disk drive in the drive bay:
   a. Attach the rails to the sides of the drive using 2 screws for each rail.
   b. Slide the drive into the bay until the rail latches snap into place.
   c. Connect the signal and power cables to the rear of the drive. Keep the cables clear of the airflow path of the fan behind the drive bays.
6. If you have other options to install, install them now. Otherwise, go to “Completing the installation” on page 62.

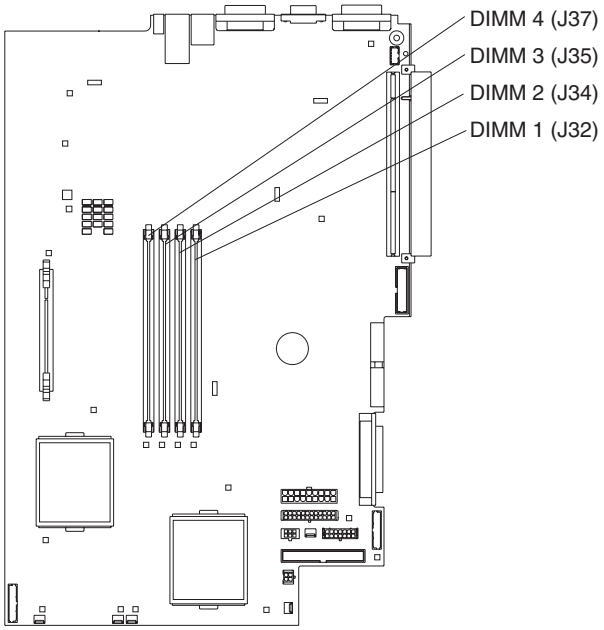
Installing memory modules

This section describes how to install memory modules in the server. Before you install memory modules, review the following information:

- The xSeries 335 Type 8676 and Type 8830 server uses interleaved dual inline memory modules (DIMMs), which requires that you add, remove, or replace DIMMs in pairs. Each pair must be of the same type, capacity, and speed.

Adding memory to the server is an easy way to improve system performance. The server comes with one pair of DIMMs installed in DIMM slots 1 and 2 on the system board.

- You can increase the amount of memory in the server by replacing them with higher-capacity DIMMs or installing an additional pair of DIMMs in slots 3 and 4. The server supports 256 MB, 512 MB, and 1 GB DIMMs. See the ServerProven® list at http://www.ibm.com/pc/compat/ on the World Wide Web for a list of memory modules supported by the server. The following illustration shows the memory slots on the system board.



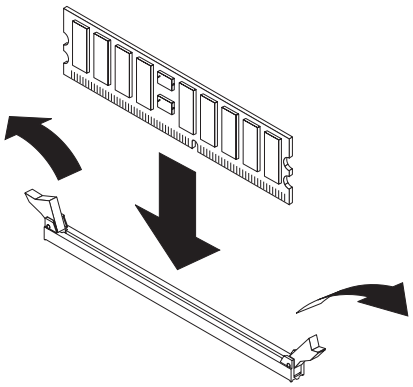
Complete the following steps to install DIMMs:

1. Read “Safety information” on page 123 and “Installation guidelines” on page 39.
2. Turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server from the rack; then, remove the server cover (see “Removing the cover and bezel” on page 46).

   Attention:

   - Avoid touching the components and gold-edge connectors on the DIMMs. Ensure that the DIMMs are completely and correctly seated in the slots. Incomplete insertion might cause damage to the system board or to the DIMMs.
   - When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For information about handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 126.
   - To avoid breaking the retaining clips or damaging the DIMM slots, handle the clips gently. Do not force the DIMM into the slot.
4. Touch the static-protective package containing the DIMM to any unpainted metal surface on the server. Then, remove the DIMM from the package.

5. Install the DIMM in the slot:



6. Open the retention latches and insert the DIMM straight into the slot, pressing down on both corners of the DIMM at the same time. The side of the DIMM with the gold-edge connectors has an index slot, offset from the center of the DIMM. Align the index slot with the slot on the system board. Ensure that no gap exists between the DIMM and the retaining clips. If a gap does exist, remove the DIMM; then, reinsert it correctly.

   If you replaced a failed DIMM, start the Configuration/Setup Utility program, select **Advanced Setup**, select **Memory Settings**, highlight the connector or bank of connectors that you want to enable, and then select **Enable**.

   With some memory configurations, the 3-3-3 beep code might sound during POST, followed by a blank display screen. If this occurs and the **Boot Fail Count** feature in the **Start Options** of the Configuration/Setup Utility program is enabled (its default setting), restart the server three times to force the BIOS to reset the memory connector or bank of connectors.

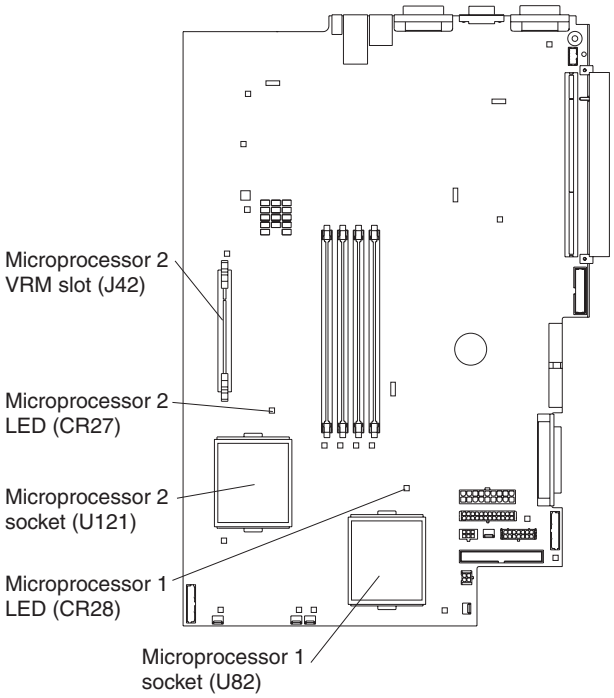
7. If you have other options to install, install them now. Otherwise, go to "Completing the installation" on page 62.

Installing a microprocessor

This section describes how to install a microprocessor in the server. Before you install a microprocessor, review the following information:

- Thoroughly review the documentation that comes with the microprocessor to determine any required BIOS update (see "Recovering the BIOS code" on page 29).
- The server comes with one microprocessor installed. The following illustration shows the microprocessor sockets and the pluggable microprocessor 2 voltage regulator module (VRM) slot on the system board. (The VRM for microprocessor

1 is integrated on the system board.)



- If one microprocessor is installed:
  - The microprocessor is installed in microprocessor socket 1 (U82).
  - The microprocessor supports both the startup and application processes.
- If you install a second microprocessor in the server:
  - The server operates as a symmetric multiprocessing (SMP) server. With an SMP, operating system application programs can distribute the processing load between the microprocessors. This enhances performance for database and point-of-sale applications, integrated manufacturing solutions, and other applications.
  - Microprocessor 1 is installed in microprocessor socket 1 (U82); microprocessor 2 is installed in socket 2 (U121).

Notes:

1. Read the documentation that comes with the microprocessor to determine if you need to update the basic input/output system (BIOS) code. The most current level of BIOS code for the server is available through the World Wide Web at http://www.ibm.com/pc/support/.
2. To use SMP, obtain an SMP-capable operating system (optional). For a list of supported operating systems, go to http://www.ibm.com/pc/us/compat/ on the World Wide Web.

Attention: To avoid damage and to ensure proper server operation, review the following information before you install a microprocessor:

- Ensure that the microprocessors are the same type, have the same cache size, and have the same clock speed.
- Ensure that the microprocessor internal and external clock frequencies are identical.
- See the ServerProven list at http://www.ibm.com/pc/compat/ for a list of microprocessors supported by the server.

A new microprocessor comes in a kit with a VRM and a heat sink.

Complete the following steps to install a microprocessor:

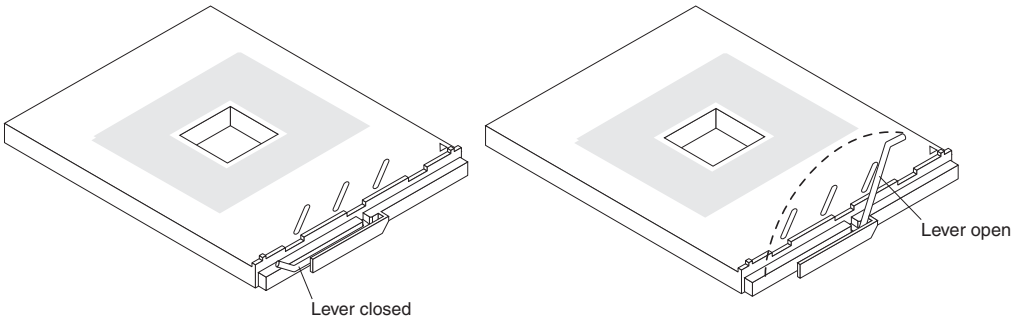
1. Read “Safety information” on page 123 and “Installation guidelines” on page 39.
2. Turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server cover (see “Removing the cover and bezel” on page 46); then, determine the socket where the microprocessor is to be installed.

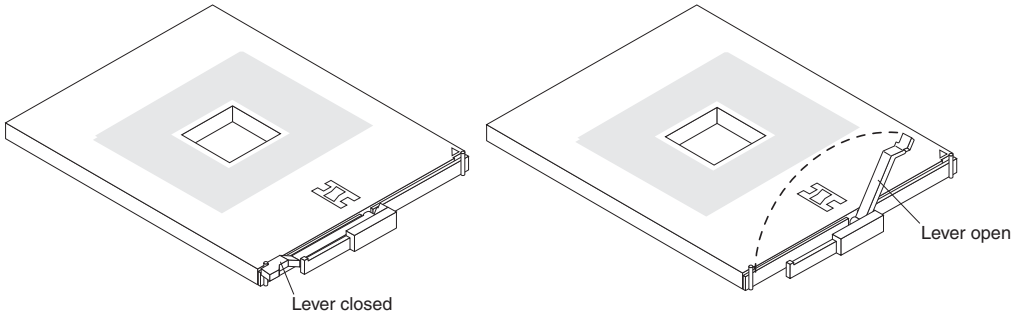
   Attention:

   - Avoid touching the components and gold-edge connectors on the microprocessor. Ensure that the microprocessor is completely and correctly seated in the socket. Incomplete insertion might cause damage to the system board or to the microprocessor.
   - When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For information about handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 126.

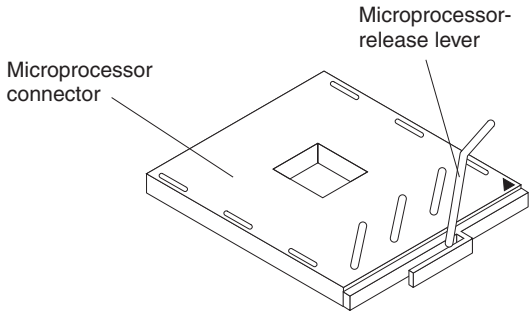
   Note: A new microprocessor comes in a kit with a VRM and a heat sink.
4. If you are installing a microprocessor in the microprocessor 2 socket, *first* install a VRM in the microprocessor 2 VRM slot (J42) and remove the protective cover from the microprocessor 2 socket.
5. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops or clicks in the fully open position (approximately 135° angle), as shown. Then, see the documentation provided with the microprocessor option for complete installation instructions.

   Attention: You must ensure that the locking lever on the microprocessor socket is in the fully open position before you insert the microprocessor in the socket. Failure to do so might result in permanent damage to the microprocessor, microprocessor socket, and system board.



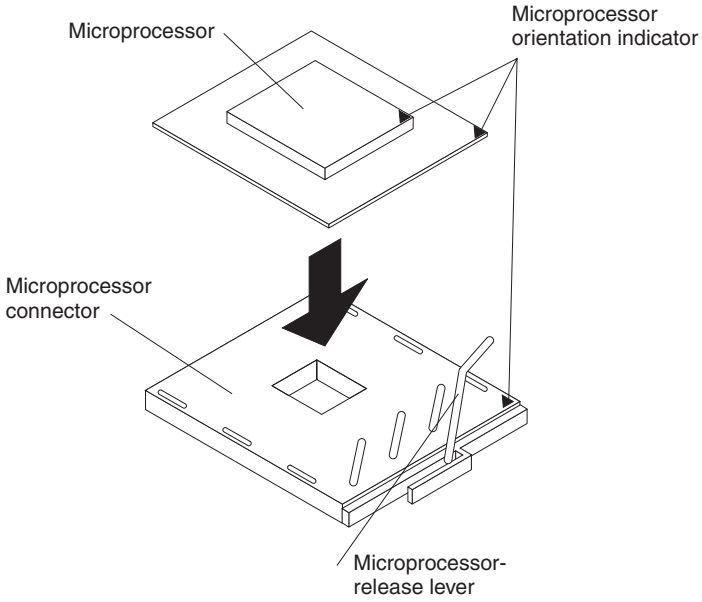


Note: The microprocessor-release lever is on the side of the socket that faces the rear of the server.



6. Install the microprocessor:
   a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the server; then, remove the microprocessor from the package.
   b. Position the microprocessor over the microprocessor socket as shown in the following illustration. Carefully press the microprocessor into the socket.

   Attention: To avoid bending the pins on the microprocessor, do not use excessive force when pressing it into the socket.



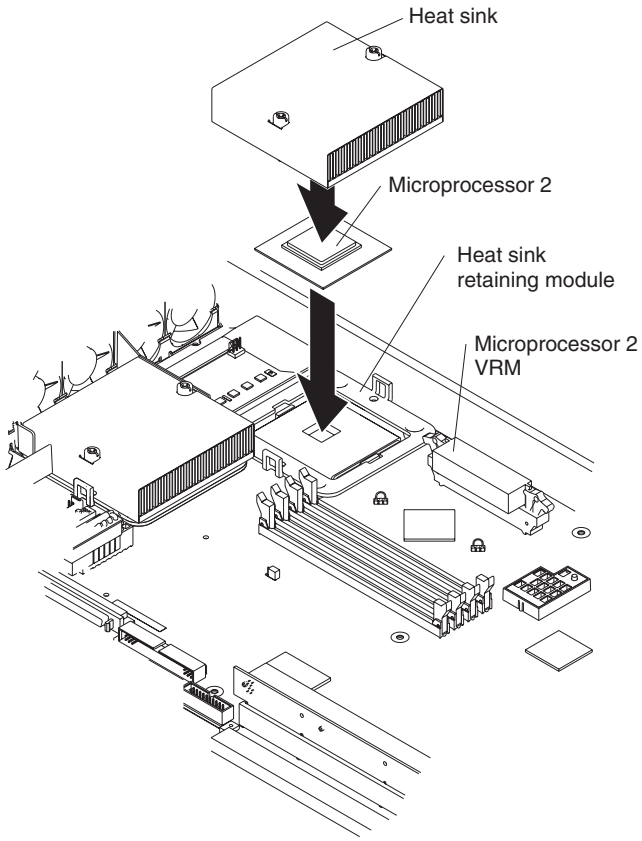
Note: The microprocessor-release lever is on the side of the socket that faces the rear of the server.

7. Close the microprocessor release lever to secure the microprocessor.

   Attention:

   - Do not disturb or contaminate the thermal material on the bottom of the new heat sink. Doing so damages its heat-conducting capability and exposes the new microprocessor to overheating.
   - If you need to remove the heat sink after installing it, note that the thermal material may have formed a strong bond between the heat sink and the microprocessor. Do not force the heat sink and microprocessor apart; doing so can damage the microprocessor pins. Loosening one captive screw fully before loosening the other captive screw helps break the bond between the components without damaging them.

8. Remove the heat sink from its package and remove the cover from the bottom of the heat sink. Ensure that the thermal material is still on the bottom of the heat sink and position the heat sink on top of the microprocessor. Press firmly on the captive screws and tighten them, alternating between screws until they are tight. Do not overtighten the screws by using excessive force.



9. If you have other options to install, install them now. Otherwise, continue with “Completing the installation” on page 62.

Replacing a fan assembly

The server comes with five replaceable fans.

Attention: If a fan fails, replace it within 48 hours to help ensure adequate cooling.

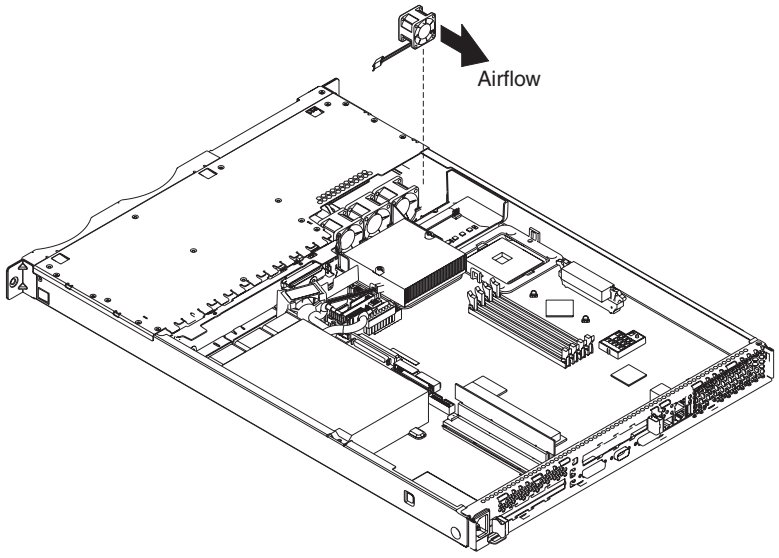
Complete the following steps to replace the fan assembly. Use this procedure to replace any fan in the server.

Note:

1. Read “Safety information” on page 123 and “Installation guidelines” on page 39.
2. Turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server.
3. Remove the server from the rack; then, remove the server cover (see “Removing the cover and bezel” on page 46).

   Attention: When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For information about handling these devices, see “Handling electrostatic discharge-sensitive devices” on page 126.
4. Determine which fan to replace by checking the LED at each fan; a lit LED indicates the fan to replace.

   Note: The fan LEDs are lit by the Light Path Diagnostics circuitry. For more information about the LEDs and Light Path Diagnostics, see “Light Path Diagnostics” on page 28 and “Light Path Diagnostic panel system error LED” on page 86.
5. Remove the fan from the server:
   a. Disconnect the fan cable from the system board, noting how the cable is routed.
   b. Lift the fan out of the server.



6. Position the replacement fan so that the airflow arrow on the side of the fan is facing or pointing toward the rear of the server.

   Note: Correct airflow is from the front to the rear of the server.
7. Position the replacement fan in the location from which you removed the failed fan.
8. Connect the replacement fan cable to the system board, making sure that the cable is routed the same way as in step 5a.
9. Continue with “Completing the installation” on page 62.

Replacing the battery

When replacing the battery you must replace it with a lithium battery of the same type, from the same manufacturer. To avoid possible danger read and follow the safety statement below.

To order replacement batteries, call 1-800-772-2227 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.

Note: After you replace the battery, you must reconfigure your server and reset the system date and time.

Statement 2:

CAUTION:
When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

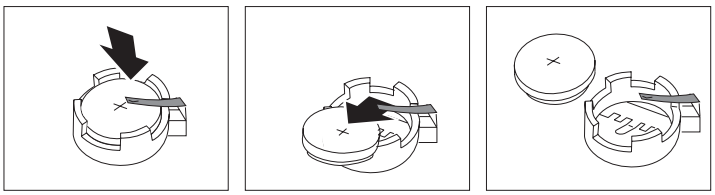
Do not:

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

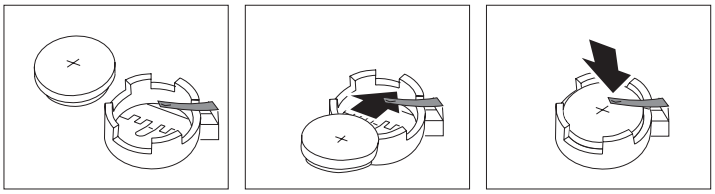
Dispose of the battery as required by local ordinances or regulations.

Complete the following steps to replace the battery:

1. Review “Safety information” on page 123 and follow any special handling and installation instructions supplied with the replacement battery.
2. Turn off the server and all attached peripheral devices. Disconnect all power cords; then, disconnect all external signal cables from the server. Remove the server cover.
3. Remove the battery:
   a. Use one finger to lift the battery clip over the battery.
   b. Use one finger to slightly slide the battery out from its socket. The spring mechanism will push the battery out toward you as you slide it from the socket.
   c. Use your thumb and index finger to pull the battery from under the battery clip.
   d. Ensure that the battery clip is touching the base of the battery socket by pressing gently on the clip.



4. Insert the new battery:
   a. Tilt the battery so that you can insert it into the socket, under the battery clip.
   b. As you slide it under the battery clip, press the battery down into the socket.



5. Reinstall the server cover, and connect the cables.
6. Turn on the server.
7. Start the Configuration/Setup Utility program and set configuration parameters.
   - Set the system date and time.
   - Set the power-on password.
   - Reconfigure the server.

   See the section about using the Configuration/Setup Utility program in the *User's Guide* for details.

Completing the installation

This section describes how to complete the installation.

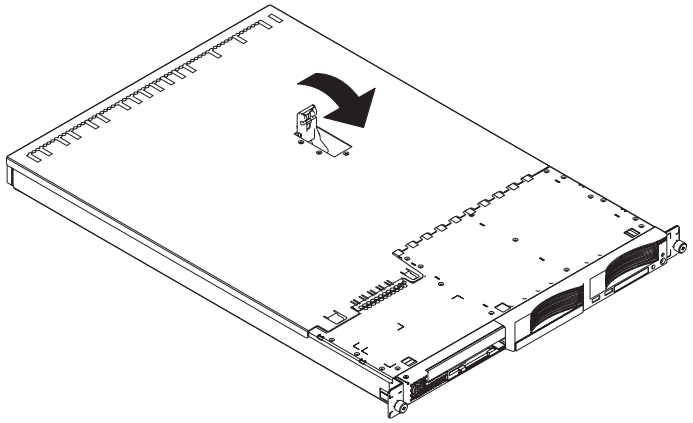
Installing the cover and bezel

Complete the following steps to install the server cover and bezel:

1. Position the internal cables so they do not interfere with the cover installation.

   Attention: Before sliding the cover forward, make sure that all the tabs on both the front and rear of the cover engage the chassis correctly. If all the tabs do not engage the chassis correctly, it will be very difficult to remove the cover later.
2. Position the cover on top of the server and slide it forward. Press down on the cover latch. The cover slides forward into position. Ensure that the cover

engages the tabs at the front and rear of the server.



3. If you removed the bezel, position the bezel directly in front of the server and press it into place so that the retention tabs snap into the holes on the top, right side, and bottom of the server.
4. If you removed the USB option tray, insert it fully into the slot below hard disk drive bay 1.
5. Install the server in the rack. See the *Rack Installation Instruction*s that come with the server for details.

   Notes:

   a. Depending on the options that you installed, after cabling the server you might need to run the Configuration/Setup Utility program to update the server configuration. See “Starting the Configuration/Setup Utility program” on page 10.
   b. If you installed a SCSI drive, check the LEDs to verify proper operation.
6. To attach peripheral devices, connect the server to other servers, and connect the power cord, continue with “Cabling the server”.

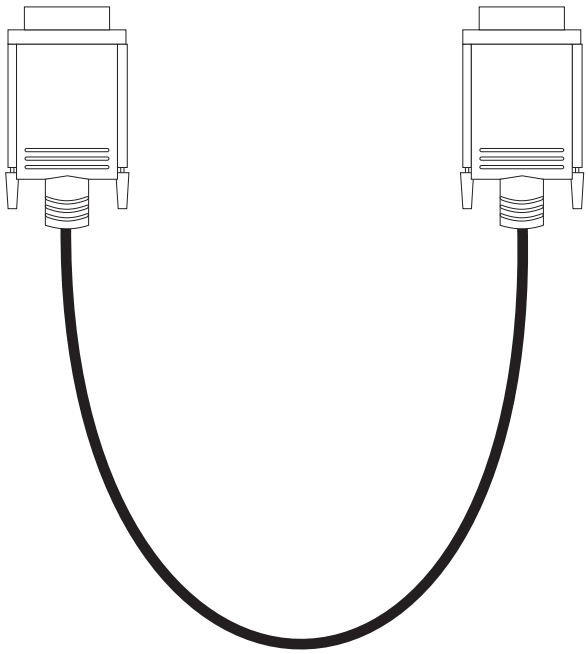
Cabling the server

To share one monitor, keyboard, and pointing device (such as a mouse) among multiple servers, connect the servers using Cable Chain Technology (C2T). In addition, you can create an Advanced System Management (ASM) interconnect network of connected servers by installing one or more Remote Supervisor Adapters.

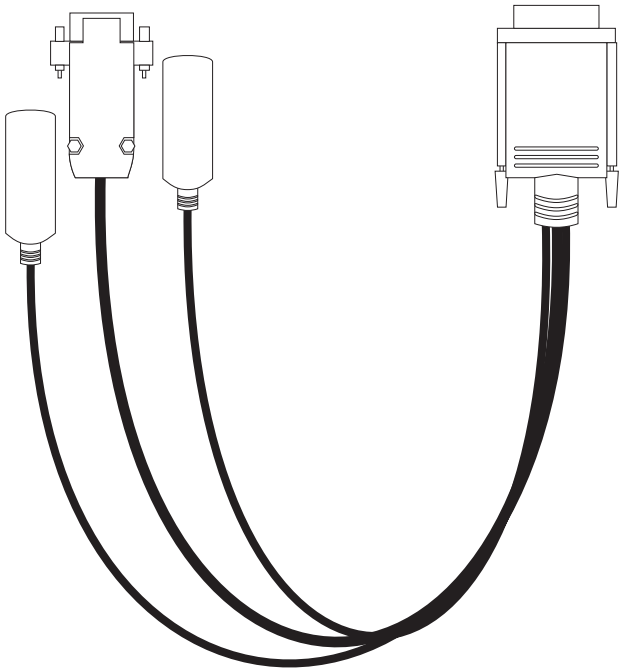
The following sections describe how to cable a C2T chain and an ASM interconnect network.

Cabling a C2T chain

Use C2T interconnect cables to connect the servers into a chain. The following illustration shows a C2T interconnect cable.



Use a C2T breakout cable (available in the C2T cable option kit) to connect the first server in the chain to the monitor, keyboard, and pointing device. The following illustration shows a C2T breakout cable.



Before cabling the C2T chain, review the following information:

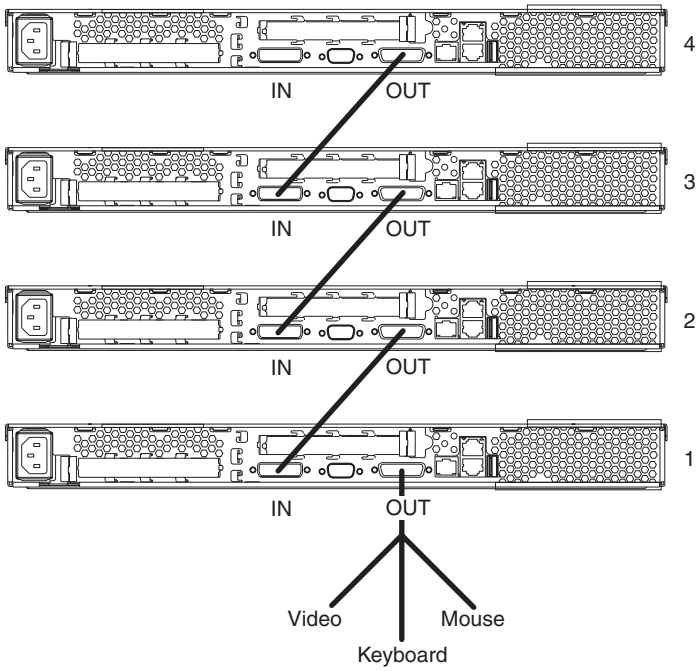
- You can connect a maximum of 42 servers in a C2T chain.
- When connecting servers that are more than 3 U apart or on different racks, you must use a 2-m (6.5-ft) C2T interconnect cable, which comes in the C2T cable option kit. You can use only one 2-m (6.5-ft) cable in a chain.
- C2T interconnect cables are hot-swappable.

- Servers are numbered by their positions in the chain (1 through *n*). If one server is removed from the chain, the remaining servers are renumbered. For example, if the 12th server is removed from a chain of 15 servers, servers 13 through 15 are renumbered to 12 through 14.
- C2T numbering is independent of other server references. For example, changing the position of a server in the C2T chain does not affect its IP address.
- C2T chaining supports a maximum video mode of 1024 x 768.

Complete the following steps to cable a C2T chain:

1. Turn off the servers.
2. Obtain a sufficient number of C2T interconnect cables. The server comes with one C2T interconnect cable that can span approximately 3 U. A 2-m (6.5-ft) C2T interconnect cable and a C2T breakout cable come in the C2T cable option kit.

   The following illustration shows a C2T chain of four servers.



   Attention: Do not allow the pins of the C2T cable connectors to touch the server chassis.

3. Connect a C2T interconnect cable from the C2T (In) connector on the first server in the chain (server 1 in the illustration, typically the bottom server in the rack) to the C2T (Out) connector on the second server in the chain (server 2 in the illustration). The connectors on the ends of the cable are different and have different colors (black for Out and white for In) to prevent you from connecting them to the wrong connectors on the servers. Repeat this step until all the servers in the chain are connected. You can connect up to 42 servers in this manner.
4. Connect a C2T breakout cable to the C2T (Out) connector on the first server in the chain (server 1 in the illustration).
5. Connect the monitor, keyboard, and pointing device to the connectors on the C2T breakout cable. The keyboard and pointing-device connectors on the cable have icons to help you identify them.
6. Turn on the servers and test the chain, using the procedure in the following section.

When you add, remove, or replace servers or change cables in the chain, it is possible for the select LED on more than one server to be lit. Press the select button on any server in the chain to turn off the select LEDs on all but the selected server.

If you are using a flat-panel monitor, you might need to adjust the image lock on the monitor. Press the select button on one of the middle servers in the chain; then, adjust the image lock on the monitor. For more information about adjusting the image lock, see the documentation that comes with your monitor.

Testing the C2T chain

After cabling the C2T chain, test the monitor, keyboard, and pointing device to ensure that they work with each server in the chain. Complete the following steps to test the chain:

1. With the servers and the monitor turned on, press the select button on server 1 in the chain.
2. Verify that the monitor is working properly.
3. Use the pointing device (mouse) to start an application.
4. Test the keyboard by typing a few words within an application.
5. Repeat steps 1 through 4 for each server in the chain.

If any of the devices do not work with any of the servers, verify that all the cables are correctly and fully connected; then, test the chain again. If the problem remains, turn off all the servers and disconnect all the C2T interconnect cables; leave the C2T breakout cable connected. Turn on server 1 and retry the devices. If the devices work, one of the C2T interconnect cables is probably defective. Connect server 2 to the chain and test the devices again. Continue adding servers to the chain and testing them, one at a time, until you identify the defective cable.

Using the C2T chain

To select the server for which you want the monitor, keyboard, and pointing device to work, press the select button on the server, or you can select the server by using the keyboard:

1. Press Num Lock on the keyboard twice. The monitor screen goes blank.
2. Type the number of the server in the chain and press Enter. The monitor now displays the image for the selected server, and the select LED on the selected server is lit.

After you have used the keyboard to specify a server number, you can use the same method (pressing Num Lock twice, then pressing + or -) to select other servers in sequence.

Note: You cannot use the + and - keys to select a server if you made the previous selection by pressing the select button on the selected server; you must have made the previous selection through the keyboard.

If you turn off the selected server, the monitor screen goes blank, and you must select another server. No more than two adjacent servers in the chain can be disconnected from their power source for the chain to work properly.

Cabling an ASM interconnect network

An Advanced System Management (ASM) bus is integrated into the C2T interconnect cables, so by adding one or more Remote Supervisor Adapters to a C2T chain of servers, you can create an Advanced System Management (ASM)

interconnect network. For information about using a Remote Supervisor Adapter for remote server management, see the documentation that comes with the adapter.

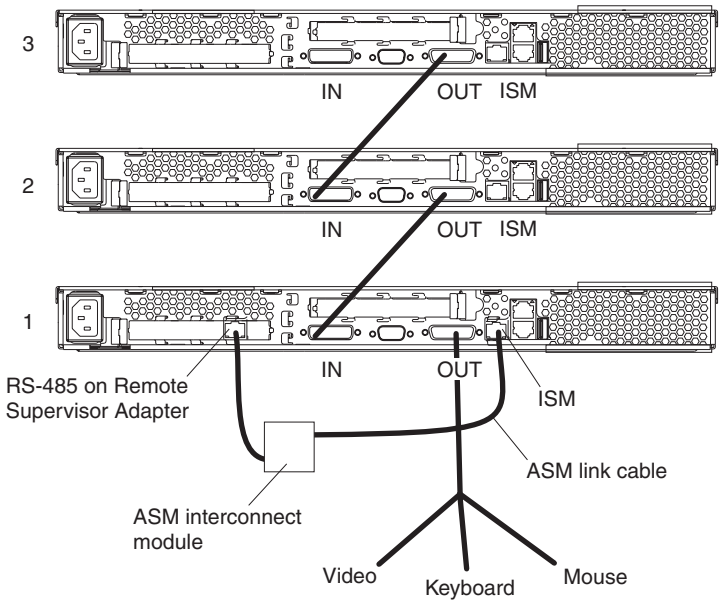
Before cabling the ASM interconnect network, review the following information:

- The cables in an ASM interconnect network are hot-swappable.
- Make sure that the firmware for the Remote Supervisor Adapter, ASM processor, and integrated system management processor (ISMP) are at the latest level.
- The servers in an ASM interconnect network are referred to by their assigned addresses, not by their positions in the rack.

An ASM interconnect network can have up to 24 RS-485 connections, depending on the configuration. The connections can include Remote Supervisor Adapters, ASM processors, ASM PCI adapters, and ISMPs. Use the following information to determine the number of servers and connections that you can have on your ASM interconnect network:

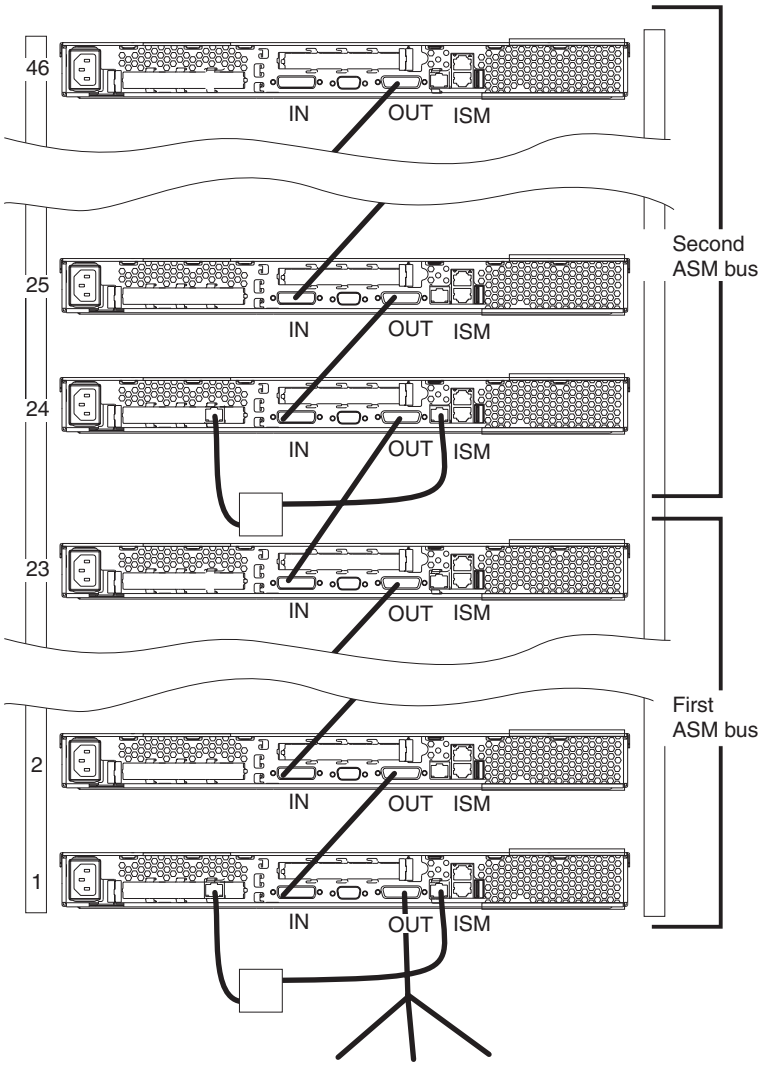
- Each Remote Supervisor Adapter, ASM processor, ASM PCI adapter, and ISMP in a server that is connected to the network uses one connection. For example, if a server that is connected to the network has a Remote Supervisor Adapter and an integrated ASM processor, the server uses two connections on the network.
- The network must include at least one server with a Remote Supervisor Adapter (either installed as an option or preinstalled in the server).

You can connect up to 23 xSeries 335 servers into an ASM interconnect network using one Remote Supervisor Adapter. However, if you use both xSeries 335 and xSeries 330 servers in the network, the xSeries 330 servers must be the lowest-numbered servers in the chain. The following illustration shows an ASM interconnect network with three servers.



You can add up to 23 more servers to the network by installing a Remote Supervisor adapter in the 24th server, creating a second ASM bus. The following

illustration shows an ASM interconnect network with 46 servers.



Complete the following steps to cable an ASM interconnect network:

1. Follow the instructions for cabling a C2T chain.
2. Connect an ASM interconnect module (which comes with the Remote Supervisor Adapter) to the RS-485 connector on the Remote Supervisor Adapter in the first server. If the network contains more than 23 servers, do the same on the 24th server.
3. Connect an ASM link cable (which comes with the Remote Supervisor Adapter) from the ASM interconnect module to the ISM connector in the first computer. Insert a terminator into the second connector on the ASM interconnect module. If the network contains more than 23 servers, do the same on the 24th server.

Updating the server configuration

When you start the server for the first time after you add or remove an internal option or an external SCSI device, you might see a message telling you that the configuration has changed. The Configuration/Setup Utility program automatically starts so that you can save the new configuration information. See “Using the Configuration/Setup Utility program” on page 10 for more information.

Some options have device drivers that you need to install. See the documentation that comes with the option for information about installing any required device drivers.

The server comes with at least one microprocessor installed on the system board. If you have installed an additional microprocessor, the server can now operate as an SMP server. Therefore, you might need to upgrade the operating system to support SMP. See the section about using the ServerGuide CD in the *User's Guide* and the operating-system documentation for additional information.

If the server has a RAID adapter installed and you have just installed or removed a hard disk drive, see the documentation that comes with the RAID adapter for information about reconfiguring the disk arrays.

If you have just installed a Remote Supervisor Adapter to manage the server from a remote location, see the section about setting up the adapter in the *Remote Supervisor Adapter User's Guide* for information about setting up and configuring the adapter and using the adapter to manage the server remotely. The *Remote Supervisor Adapter User's Guide* comes with the adapter.

To configure the integrated Gigabit Ethernet controllers, see "Configuring the Gigabit Ethernet controller" on page 19.

Installing the server in a rack

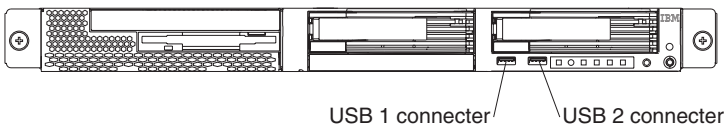
Detailed cabling instructions for a typical rack server configuration are provided on the IBM *xSeries Documentation CD* that come with your server. These instructions also come with the Tower-to-Rack Conversion Kit.

Input/output connectors

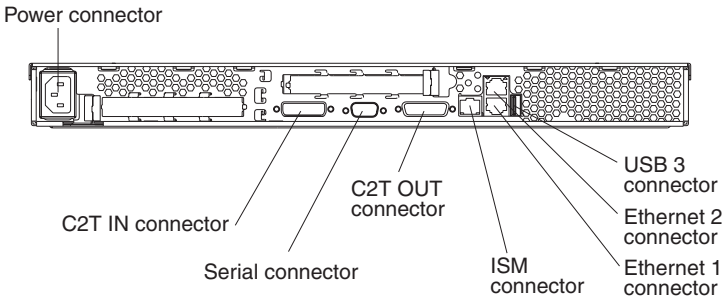
Connect optional external devices to the connectors on the front and rear of the server.

Your server has the following input/output (I/O) connectors:
- Serial (1, rear)
- Universal Serial Bus (USB) (2 front, 1 rear)
- ISM (1, rear)
- Cable Chaining Technology (C2T) (2, rear)
- Ethernet (2, rear)
- Keyboard (1, on C2T breakout cable)
- Auxiliary-device (pointing-device) (1, on C2T breakout cable)
- Video (1, on C2T breakout cable)

The following illustration shows the locations of the connectors on the front panel.



The following illustration shows the locations of the connectors on the rear panel.



The following sections describe these connectors.

If you have an optional Remote Supervisor Adapter (system-management adapter) installed in PCI-X slot 1, the adapter has an Ethernet connector, a serial connector, and an Advanced System Management (ASM) Interconnect connector. See the documentation that comes with the Remote Supervisor Adapter for more information about the ASM Interconnect network.

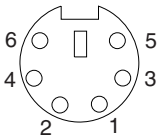
C2T connectors

Use the C2T (IN) and C2T (OUT) connectors to connect the server to other servers in an ASM interconnect network or C2T chain. See “Cabling the server” on page 63 for information about ASM interconnect networks and C2T chaining.

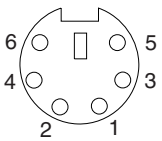
C2T breakout cable connectors

These connectors are on the C2T breakout cable, which you use to connect a monitor, keyboard, and pointing device to a server in a C2T chain. See “Cabling the server” on page 63 for information about C2T chaining.

Auxiliary-device (pointing-device) connector: Use this connector to connect a mouse or other pointing device. This connector has a mouse icon to help you identify it. The following illustration shows an auxiliary-device connector.



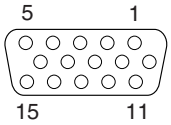
Keyboard connector: Use this connector to connect a PS/2 (non-USB) keyboard to the server. The connector has a keyboard icon to help you identify it. The following illustration shows a keyboard connector.



If you attach a keyboard to this connector, USB ports and devices are disabled during POST.

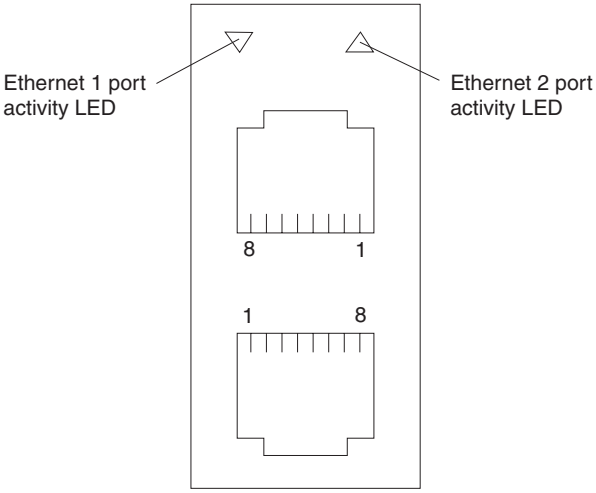
Video connector: Use this connector to connect a monitor to the server. The connector is dark blue to help you identify it. The following illustration shows a video

connector.



Ethernet connector

The following illustration shows the dual Ethernet connector.

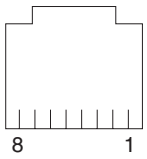


Connect a Category 3, 4, or 5 unshielded twisted-pair cable to this connector. The 100BASE-TX and 1000BASE-T Fast Ethernet standards require Category 5 or higher cabling.

For more information about the Ethernet controller, see “Configuring the Gigabit Ethernet controller” on page 19.

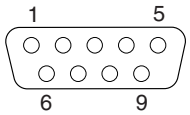
Integrated system management connector

Use this connector to connect an optional Remote Supervisor Adapter. See “Cabling the server” on page 63 for information about using a Remote Supervisor Adapter to manage servers on an ASM interconnect network. The following illustration shows an integrated system management connector.



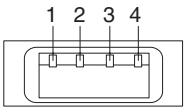
Serial connector

Use a serial connector to connect a serial device. The following illustration shows a serial connector.



Universal Serial Bus connectors

Use a Universal Serial Bus (USB) connector to connect a USB device. USB technology transfers data at up to 12 Mb per second (Mbps) with a maximum of 127 devices and a maximum signal distance of 5 meters (16 ft) per segment. Using Plug and Play technology, USB devices are configured automatically. The following illustration shows a USB connector.



Use a 4-pin cable to connect a device to a USB connector. If you need to connect more USB devices than the server has USB connectors for, use a USB hub to connect additional devices.

If you connect a PS/2 (non-USB) keyboard to the keyboard connector, USB ports and devices are disabled during POST.

If you connect a USB keyboard that has a mouse port, the keyboard emulates a mouse, and you cannot disable the mouse settings in the Configuration/Setup Utility program.

Chapter 5. Service replaceable units

This chapter describes the removal of server components.

Important: The field replaceable unit (FRU) procedures are intended for trained servicers who are familiar with IBM xSeries products. See the parts listing in “System” on page 116 to determine if the component being replaced is a customer replaceable unit (CRU) or a FRU.

Thermal grease

This section contains information about removing and replacing the thermal grease between the heat sink and the microprocessor. The thermal grease must be replaced anytime the heat sink has been removed from the top of the microprocessor and is going to be reused, or when debris is found in the grease.

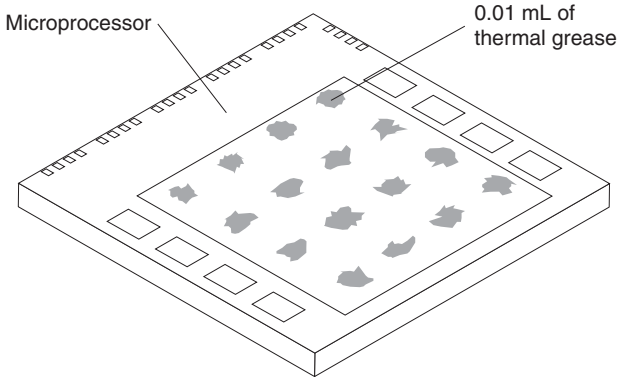
Note:

- Read “Installation guidelines” on page 39.
- Read the safety notices at “Safety information” on page 123.
- Read “Handling electrostatic discharge-sensitive devices” on page 126.

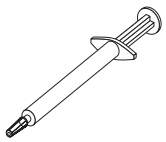
Complete the following steps to replace damaged or contaminated thermal grease on the microprocessor and heat sink:

1. Place the heat sink on a clean work surface.
2. Remove the cleaning pad from its package and unfold it completely.
3. Use the cleaning pad to wipe the thermal grease from the bottom of the heat sink.

   Note: Be sure that all of the thermal grease is removed.
4. Use a clean area of the cleaning pad to wipe the thermal grease from the microprocessor; then, dispose of the cleaning pad after all of the thermal grease is removed.



5. Use the thermal grease syringe to place 16 uniformly spaced dots of 0.01 mL each on the top of the microprocessor.



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Note: 0.01 mL is one tick mark on the syringe. If the grease is properly applied, approximately half of the grease will remain in the syringe.

6. Install the heat sink onto the microprocessor as described in “Installing a microprocessor” on page 55.

Power supply

Complete the following steps to remove the non-hot-swap power supply.

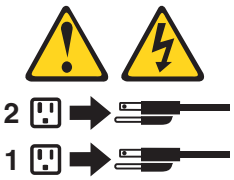
Note:

- Read “Installation guidelines” on page 39.
- Read the safety notices at “Safety information” on page 123.
- Read “Handling electrostatic discharge-sensitive devices” on page 126.

Statement 5:

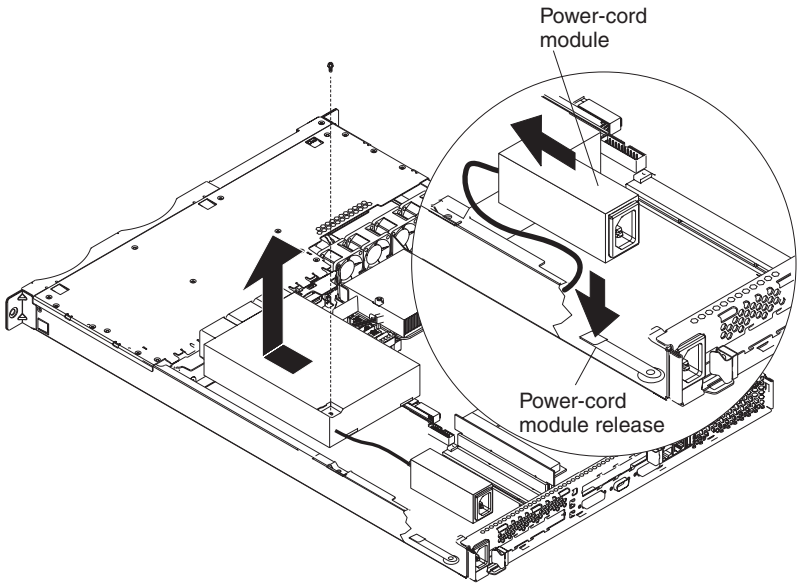
CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



1. Turn off the server and all attached peripheral devices.
2. Disconnect all power cords and external cables from the back of the server.
3. Remove the server from the rack; then, remove the server cover (see “Removing the cover and bezel” on page 46) and take out the air baffle.
4. Remove the power-cord module.

Note: The illustrations in this publication might differ slightly from your hardware.



a. Press down on the retention clip at the front of the power-cord module and slide the module toward the front of the server until the alignment tab is free of the slot on the side of the server.
b. Lift the power-cord module out of the server as far as the power supply cable permits and set it aside.

5. Remove the DASD fan duct assembly located near the power supply (see illustration at “Replacing a fan assembly” on page 59).

   Attention: Prior to removing the power supply, ensure that the round USB cable and the flat ribbon cable are out of the way so as to avoid damage.

6. Remove the power supply:
   a. Disconnect the cables on the power supply.
   b. Remove the screw holding the power supply to the chassis and slide the power supply toward the front of the server until it disengages from the tabs on the floor of the chassis.

To install the new power supply, reverse this procedure, making sure that all cables are routed correctly and do not block the air flow from the fan.

Operator information card

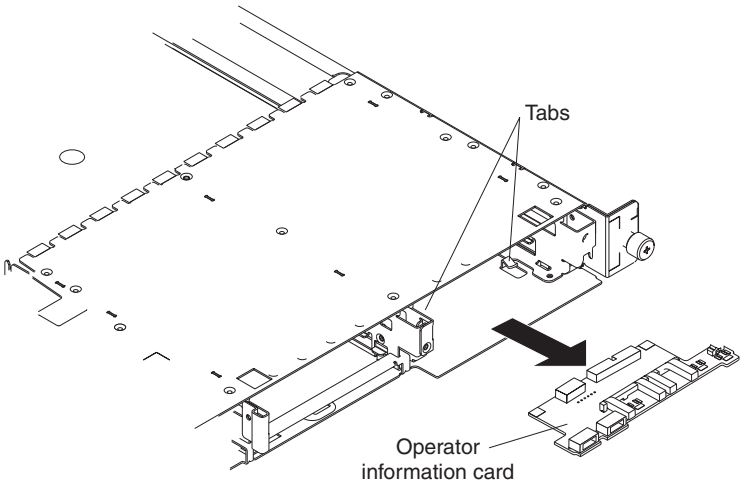
Complete the following steps to remove the operator information card.

Note:

- Read “Installation guidelines” on page 39.
- Read the safety notices at “Safety information” on page 123.
- Read “Handling electrostatic discharge-sensitive devices” on page 126.

1. Turn off the server.
2. Disconnect all power cords and external cables from the back of the server; then, remove the server from the rack.
3. Remove the server cover and bezel (see “Removing the cover and bezel” on page 46).
4. Remove the hard disk drive residing in the right-hand bay, if any (see “Hard disk drives” on page 51).
5. Disconnect the operator information card cables from the system board.

   Note: The illustrations in this publication might differ slightly from your hardware.



6. Gently pull the operator information card forward until it disengages from the two tabs on the chassis, making sure that any cables that are pulled slide smoothly.
7. Disconnect the cables from the rear of the operator information card.

To replace the operator information card, connect the two cables to the rear of the card and slide it under the tabs on the chassis until it is firmly anchored.

Diskette drive

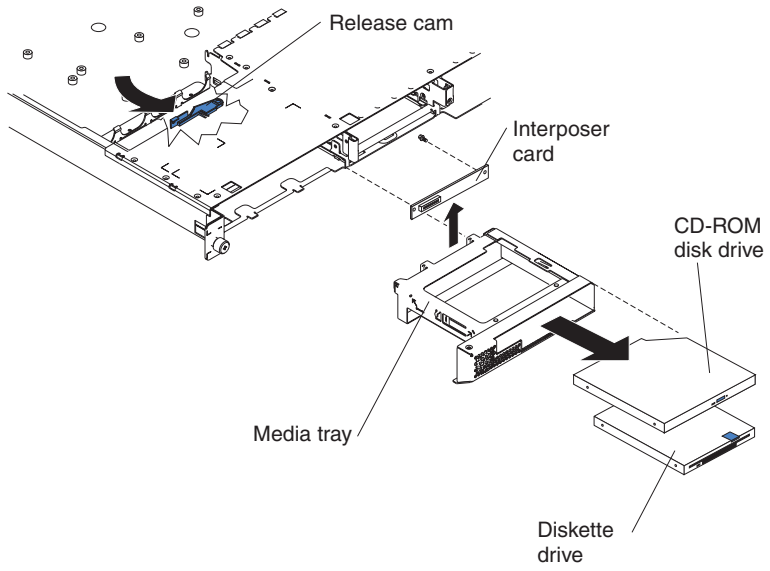
Complete the following steps to remove the diskette drive.

Note:

- Read “Installation guidelines” on page 39.
- Read the safety notices at “Safety information” on page 123.
- Read “Handling electrostatic discharge-sensitive devices” on page 126.

1. Turn off the server and all attached devices.
2. Disconnect all power cords and external cables from the back of the server.
3. Remove the server from the rack.
4. Remove the server cover (see “Removing the cover and bezel” on page 46); then, take out the air baffle.
5. Remove the four microprocessor fans, making note of their orientation for later replacement.
6. Disconnect the diskette drive signal and CD-ROM drive power cables from the system board.
7. Disconnect the IDE cable from the CD-ROM drive.
8. Press the release cam until the media tray protrudes slightly from the front of the server.

   Note: The illustrations in this publication might differ slightly from your hardware.



9. Carefully pull the drive assembly out of the chassis.
10. Remove the retaining wires on the drive assembly.
11. To remove the CD-ROM drive from the media tray, pull gently on the drive and slide it out of the tray.
12. To remove the diskette drive from the media tray, pull gently on the drive and slide it out of the tray.
13. To remove the interposer card, remove the screw that secures it to the media tray and pull the card away from the media tray.

To replace the diskette drive, reverse the previous steps.

SCSI backplane

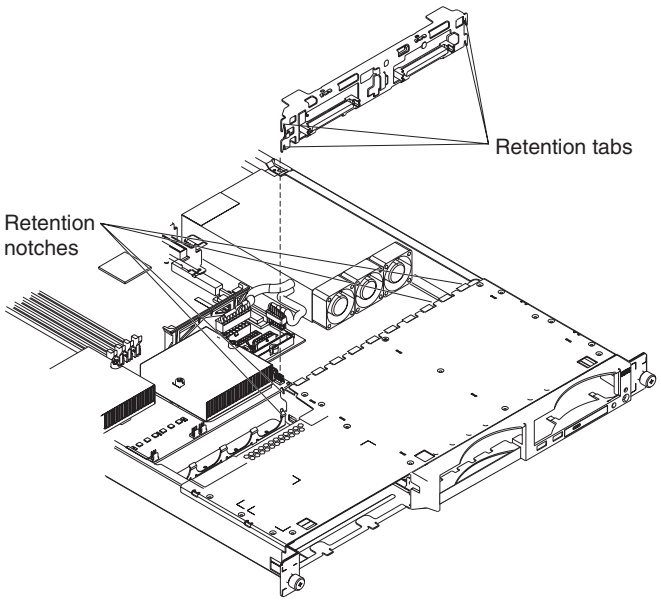
Complete the following steps to remove the SCSI backplane.

Note:

- Read “Installation guidelines” on page 39.
- Read the safety notices at “Safety information” on page 123.
- Read “Handling electrostatic discharge-sensitive devices” on page 126.

1. Turn off the server.
2. Disconnect all power cords and external cables from the back of the server.
3. Remove the server from the rack.
4. Pull out the hard drives.
5. Remove the server cover (see “Removing the cover and bezel” on page 46).
6. Disconnect th cables from the SCSI backplane.

   Note: The illustrations in this publication might differ slightly from your hardware.



7. Gently pull up on the backplane until it is released from the server at the notches; then, pull the backplane out of the server.

To replace the SCSI backplane, reverse the previous steps, making sure to align the tabs and notches.

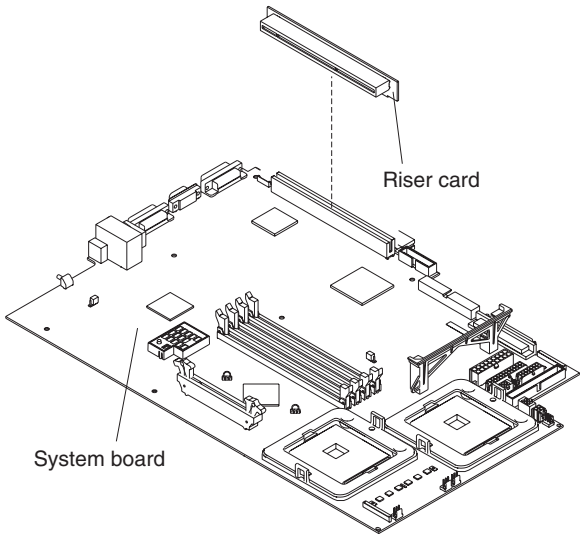
Riser card

Complete the following steps to remove the riser card.

Note:

- Read “Installation guidelines” on page 39.
- Read the safety notices at “Safety information” on page 123.
- Read “Handling electrostatic discharge-sensitive devices” on page 126.

1. Turn off the server and any attached devices.
2. Disconnect power cords and external cables from the back of the server.
3. Remove the server from the rack.
4. Remove the cover (see “Removing the cover and bezel” on page 46).
5. Remove adapters (see “Working with adapters” on page 47).



6. Pull up gently on the riser card until it detaches from the server.

To replace the riser card, reverse the preceding steps.

System board

Complete the following steps to remove the system board.

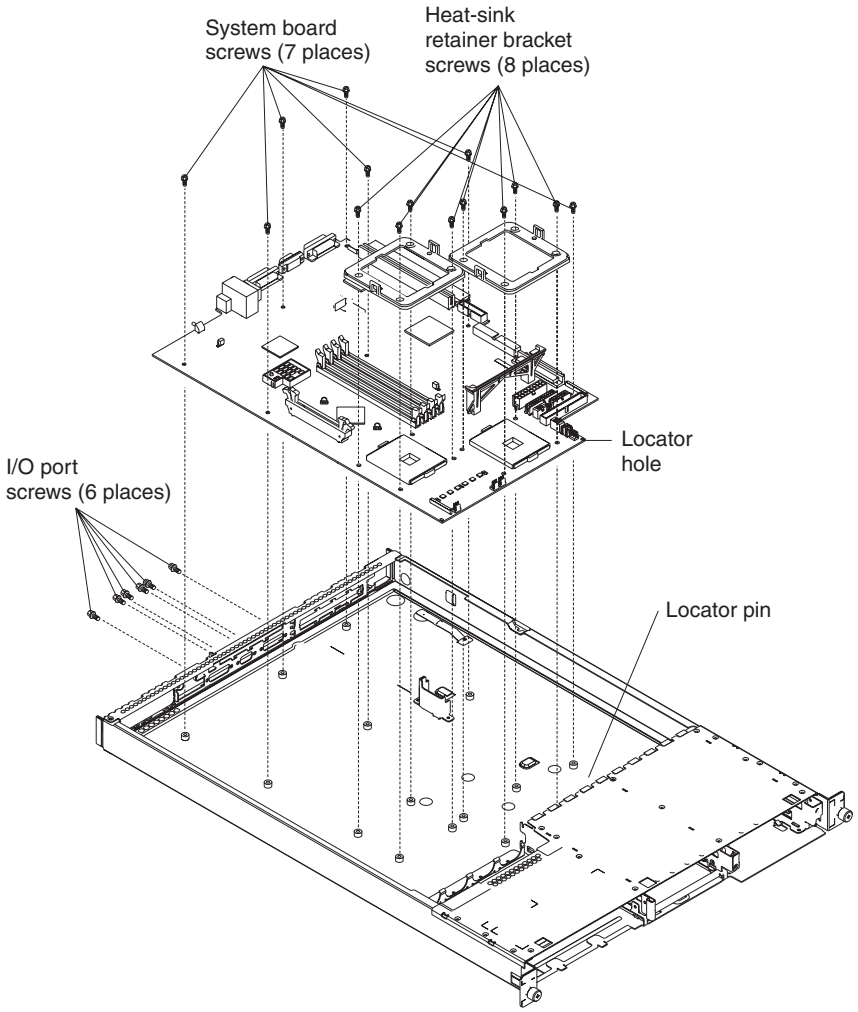
Note:

- Read “Installation guidelines” on page 39.
- Read the safety notices at “Safety information” on page 123.
- Read “Handling electrostatic discharge-sensitive devices” on page 126.

1. Turn off the server and any attached devices.

   Note: When replacing the system board, you must either update the system with the latest firmware or restore the pre-existing firmware that the customer provides on a diskette or CD image.
2. Disconnect power cords and external cables from the back of the server.
3. Remove the server from the rack.
4. Remove the cover (see “Removing the cover and bezel” on page 46).
5. Remove the air baffle.
6. Remove all adapters (see “Working with adapters” on page 47).
7. Remove all fans (see “Replacing a fan assembly” on page 59).
8. Remove the riser card (see “Riser card” on page 79).
9. Remove the SCSI backplane (see “SCSI backplane” on page 78).
10. Disconnect all cables from the system board.
11. Remove all microprocessors and removable VRMs and set them aside on a static-protected surface for reinstallation (see “Installing a microprocessor” on page 55).
12. Remove the memory modules and set them aside on a static-protected surface for reinstallation (see “Installing memory modules” on page 53).

Note: The illustrations in this publication might differ slightly from your hardware.



13. Remove the six I/O port screws at the rear of the server.
14. Remove the eight screws securing the two heat sink retention modules to the system board. These eight screws also secure the system board to the chassis.
15. Remove the seven screws on the system board that secure the system board to the chassis.
16. Pull the board carefully out of the server, taking special care not to disturb any surrounding components.
17. To reinstall the board, place it carefully into position and ensure the locator pin engages the locator hole in the system board.
18. Reverse steps 5 on page 80 through 12 on page 80 to replace the components that were removed.

Note: When reassembling the components in the server, be sure to route all cables carefully so that they are not exposed to undue pressure.

Chapter 6. Symptom-to-FRU index

This index supports xSeries 335 servers.

Notes:

1. Check the configuration before you replace a FRU. Configuration problems can cause false errors and symptoms.
2. For IBM devices not supported by this index, refer to the manual for that device.
3. Always start with "General checkout" on page 21.

The symptom-to-FRU index lists symptoms, errors, and the possible causes. The most likely cause is listed first. Use this symptom-to-FRU index to help you decide which FRUs to have available when servicing the computer.

The left-hand column of the tables in this index lists error codes or messages, and the right-hand column lists one or more suggested actions or FRUs to replace.

Note: Some tables have more than two columns; in those instances, more than one column on the left is required to describe the error symptom.

Take the action (or replace the FRU) suggested first in the list of the right-hand column, then try the server again to see if the problem has been corrected before taking further action.

Note: Always try reseating a suspected component or reconnecting a cable before replacing the component.

The POST BIOS code displays POST error codes and messages on the screen.

Beep symptoms

Beep symptoms are short tones or a series of short tones separated by pauses (intervals without sound). See the examples in the following table.

Beeps	Description
1-2-3	• One beep • A pause (or break) • Two beeps • A pause (or break) • Three beeps
4	Four continuous beeps

One beep after successfully completing POST indicates the system is functioning properly.

Note: See "System" on page 116 to determine which components should be replaced by a field service technician.	
Beep/symptom	**FRU/action**
1-1-2 (Microprocessor register test failed)	1. **Optional microprocessor (if installed)** 2. Microprocessor 3. System board

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Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Beep/symptom	**FRU/action**
1-1-3 (CMOS write/read test failed)	1. **Battery** 2. System board
1-1-4 (BIOS EEPROM checksum failed)	1. **DIMM** 2. System board
1-2-1 (Programmable Interval Timer failed)	• **System board**
1-2-2 (DMA initialization failed)	• **System board**
1-2-3 (DMA page register write/read failed)	• **System board**
1-2-4 (RAM refresh verification failed)	1. **DIMM** 2. System board
1-3-1 (first 64K RAM test failed)	1. **DIMM** 2. System board
1-3-2 (first 64K RAM parity test failed)	1. **DIMM** 2. System board
2-1-1 (Secondary DMA register failed)	• **System board**
2-1-2 (Primary DMA register failed)	• **System board**
2-1-3 (Primary interrupt mask register failed)	• **System board**
2-1-4 (Secondary interrupt mask register failed)	• **System board**
2-2-1 (Interrupt vector loading failed)	• **System board**
2-2-2 (Keyboard controller failed)	1. **Keyboard** 2. System board
2-2-3 (CMOS power failure and checksum checks failed)	1. **Battery** 2. System board
2-2-4 (CMOS configuration information validation failed)	1. **Battery** 2. System board
2-3-1 (Screen initialization failed)	• **System board**
2-3-2 (Screen memory failed)	• **System board**
2-3-3 (Screen retrace failed)	• **System board**
2-3-4 (Search for video ROM failed)	• **System board**
2-4-1 (Video failed; screen believed operable)	• **System board**
3-1-1 (Timer tick interrupt failed)	• **System board**
3-1-2 (Interval timer channel 2 failed)	• **System board**
3-1-3 (RAM test failed above address OFFFFH))	1. **DIMM** 2. System board

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Beep/symptom	**FRU/action**
3-1-4 (Time-Of-Day clock failed)	1. **Battery** 2. System board
3-2-1 (Serial port failed)	• **System board**
3-2-2 (Parallel port failed)	• **System board**
3-2-3 (Math coprocessor test failed)	1. **Microprocessor** 2. System board
3-2-4 (Failure comparing CMOS memory size against actual)	1. **DIMM** 2. System board 3. Battery
3-3-1 (Memory size mismatch occurred.)	1. **DIMM** 2. System board 3. Battery
3-3-2 (Critical SMBUS error occurred)	1. **Disconnect the server power cord from outlet, wait 30 seconds and retry.** 2. System board. 3. DIMMs. 4. DASD backplane. 5. DASD power cable.
3-3-3 (No operational memory in system) **Note:** In some memory configurations, the 3-3-3 beep code might sound during POST followed by a blank display screen. If this occurs and the **Boot Fail Count** feature in the **Start Options** of the Configuration/Setup Utility is set to **Enabled** (its default setting), you must restart the server three times to force the system BIOS code to reset the memory connector or bank of connectors from **Disabled** to **Enabled**.	1. **Install or reseat the memory modules, and then do a 3 boot reset.** (For more information on a 3 boot reset, see “Using the Configuration/Setup Utility program” on page 10.) 2. DIMMs. 3. System board.
4-4-4 (Optional system management adapter not installed in slot 1 or not functioning correctly)	1. **Verify that the adapter is installed in slot 1.** 2. Adapter. 3. System board.
Two short beeps (Information only, the configuration has changed)	1. **Run Diagnostics.** 2. Run the Configuration/Setup Utility program.
Three short beeps	1. **DIMM** 2. System board
One continuous beep	1. **Microprocessor** 2. Optional microprocessor (if installed) 3. System board

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Beep/symptom	**FRU/action**
Repeating short beeps	1. **Keyboard** 2. System board

No-beep symptoms

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
No-beep symptom	**FRU/action**
No beep and the system operates correctly.	1. **System board**
No beep and no video (System error LED is OFF)	• **See “Undetermined problems” on page 112.**
No beep and no video (System Attention LED is ON)	• **See “Light Path Diagnostic panel system error LED”.**

Light Path Diagnostic panel system error LED

The system-error LED is lit when an error is detected. If the system-error LED is lit, remove the cover and check the diagnostic panel LEDs. The following table is a complete list of diagnostics panel LEDs followed by the FRU or action for correcting the problem. The information in the table is valid only when the system-error LED is lit.

Notes:
1. If a diagnostics panel LED is lit and the information LED panel system-error LED is off, there is probably an LED problem. Run LED diagnostics.
2. To locate the LEDs on the system board, see “System-board LEDs” on page 44.
3. Check the System Error Log for additional information before replacing a FRU.
4. The DIMM error LEDs, microprocessor error LEDs, and VRM error LEDs turn off when the system is turned off.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Diagnostics panel LED	**FRU/action**
All LEDs off (Check System Error Log for error condition, then clear System Error Log when the problem is found.)	1. **System Error Log is 75% full; clear the log.** 2. PFA alert; check log for failure; clear PFA alert; remove ac power for at least 20 seconds, reconnect, then turn on the system. 3. Run Light Path Diagnostics.
CPU (Microprocessor failure. The LED next to the failing CPU is on.)	1. **Failing microprocessor** 2. System board
CNFG (The microprocessor or microprocessor VRM configuration is incorrect.)	1. **Verify that microprocessors are compatible (see “Installing a microprocessor” on page 55).** 2. If only one microprocessor is installed, make sure it is located in socket U82. 3. Verify that VRM is present if two microprocessors are installed. 4. Microprocessor. 5. VRM.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Diagnostics panel LED	**FRU/action**
VRM LED on (A voltage regulator module (VRM) failed. The LED next to the failing VRM is on.)	1. **Failing VRM** 2. System board
MEM (System memory failed. The LED next to the failing DIMM is on.)	1. **Failing DIMM** 2. System board
SP (Integrated system management processor (ISMP) failed.)	1. **Unplug the server for 30 seconds, and then retry.** 2. Reflash or update firmware for ISMP, BIOS. 3. System board.
PS (Power supply failed.)	1. **Verify that fan near power supply has clear air flow, rerouting cables if necessary.** 2. Power supply. 3. System board.
TEMP (Temperature exceeded a threshold level.)	1. **Ambient temperature must be within normal operating specifications. See “Features and specifications” on page 2.** 2. Ensure fans are operating correctly. 3. Examine System Error Log. a. System over recommended temperature b. Power switch assembly c. DASD over recommended temperature (DASD LED also on) 1) Overheating hard disk drive 2) DASD backplane 3) System board d. System over recommended temperature for microprocessor *x* (where *x* is 1 or 2) (CPU LED is also on) 1) Microprocessor *x* 2) System board e. System board over recommended temperature • System board
FAN (A fan failed or is operating slowly.)	1. **Check individual fan LEDs.** 2. Replace respective fan. 3. System board.
DASD (The LED located next to the drive bay that the failing drive is installed in is lit. Check the amber drive LED for the failing hard drive.)	1. **Be sure the fans are operating correctly and the airflow is good.** 2. SCSI backplane.
PCI A (PCI/PCI-X slot 2 failed or the integrated SCSI adapter failed.)	1. **Adapter** 2. System board
PCI B (An integrated Ethernet controller or PCI/PCI-X slot 1 failed.)	1. **Adapter** 2. System board
PCI C (PCI/PCI-X slot 1 or the integrated video adapter failed.)	1. **Adapter** 2. System board
NMI (Nonmaskable interrupt occurred.)	1. **Restart the server.** 2. Check the System Error Log.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Diagnostics panel LED	**FRU/action**
NON OPT (A PCI bus is not operating at maximum efficiency.)	• **Switch adapters, if possible.** If adapters cannot be switched, they will continue to operate at lowered efficiency and light will remain lit.

Diagnostic error codes

Note: In the following error codes, if *XXX* is *000*, *195*, or *197*, *do not* replace a FRU. The description for these error codes are:

000 The test passed.

195 The Esc key was pressed to stop the test.

197 Warning; a hardware failure might not have occurred.

For all error codes, replace the FRU or take the action indicated.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
001-XXX-000 (Failed core tests)	• **System board**
001-XXX-001 (Failed core tests)	• **System board**
001-250-000 (Failed system board ECC)	• **System board**
001-250-001 (Failed processor board ECC)	• **System board**
005-XXX-000 (Failed video test)	1. **Video adapter (if installed)** 2. System board
011-XXX-000 (Failed COM1 serial port test)	• **Check loopback plug connected to externalized serial port.** • Check cable from externalized port to system board.
011-XXX-001 (Failed COM2 serial port test)	• **Check loopback plug connected to externalized serial port.** • Check cable from externalized port to system board.
014-XXX-000 (Failed parallel port test)	• **System board**
015-XXX-001 (USB interface not found, board damaged)	1. **System board**
015-XXX-015 (Failed USB external loopback test)	1. **Make sure the parallel port is not disabled.** 2. Run the USB external loopback test again. 3. System board.
015-XXX-198 (USB device connected during USB test)	1. **Remove USB devices from USB1 and USB2.** 2. Run the USB external loopback test again. 3. System board.
020-XXX-000 (Failed PCI interface test)	• **System board**
020-XXX-001 (Failed hot-swap slot 1 PCI latch test)	1. **PCI hot-swap latch assembly** 2. System board
020-XXX-002 (Failed Hot-swap slot 2 PCI latch test)	1. **PCI hot-swap latch assembly** 2. System board

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
020-XXX-003 (Failed hot-swap slot 3 PCI latch test)	1. **PCI hot-swap latch assembly** 2. System board
020-XXX-004 (Failed hot-swap slot 4 PCI latch test)	1. **PCI hot-swap latch assembly** 2. System board
030-XXX-000 (Failed internal SCSI interface test)	• **System board**
035-XXX-099	1. **No adapters were found.** 2. If adapter is installed re-check connection.
035-XXX-s99 (Failed RAID test on PCI slot s. s = number of failing PCI slot. Check System Error Log before replacing a FRU.)	1. **RAID adapter** 2. SCSI backplane 3. Cable
035-XXX-snn (Check System Error Log before replacing a FRU. *s* = number of failing PCI slot, *nn* = SCSI ID of failing fixed disk.)	• **Hard disk drive with SCSI ID *nn* on RAID adapter in PCI slot *s*.**
035-253-s99 (RAID adapter initialization failure)	1. **ServeRAID adapter in slot *s* is not configured properly.** Obtain the basic and extended configuration status and see the *ServeRAID Hardware Maintenance Manual* for more information. 2. Cable. 3. SCSI backplane. 4. Adapter.
075-XXX-000 (Failed power supply test)	• **Power supply**
089-XXX-001 (Failed microprocessor test)	1. **Microprocessor 1** 2. System board
089-XXX-002 (Failed optional microprocessor test)	1. Optional microprocessor 2 2. System board
165-060-000 (Service Processor: ASM may be busy)	1. **Rerun the diagnostic test.** 2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. 3. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 4. System board.
165-198-000 (Service Processor: Aborted)	1. **Rerun the diagnostic test** 2. Fix other error conditions that may be keeping ASM busy. Refer to the error log and diagnostic panel. 3. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 4. System board.
165-201-000 (Service Processor: Failed)	1. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 2. System board. Before replacing the system board, ensure that system board jumper J38 is not installed (the default) when the error occurs.
165-330-000 (Service Processor: Failed)	1. Update to the latest ROM diagnostic level and retry.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
165-342-000 (Service Processor: Failed)	1. Ensure latest firmware levels for ASM and BIOS are installed. 2. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 3. System board.
166-198-000 System Management: Aborted (Unable to communicate with ASM. It may be busy. Run the test again.)	1. **Run the diagnostic test again.** 2. Correct other error conditions and retry. These include other failed system management tests and items logged in the System Error Log of the optional Remote Supervisor Adapter. 3. Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry. 4. Remote Supervisor Adapter, if installed. 5. System board.
166-201-001 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **If installed, reseat the I2C cable between the Remote Supervisor Adapter (in PCI slot 1/J1) and the system board (J2).** 2. DIMMs. 3. System board.
166-201-002 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **Reseat I2C cable between the operator information card and the system board (J10).** 2. Operator information card. 3. System board.
166-201-003 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **Reseat cables between the system board and the power supply.** 2. Power supply. 3. System board.
166-201-004 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **SCSI backplane** 2. System board
166-201-005 System Management: Failed (I2C bus error(s) See SERVPROC and DIAGS entries in event log.)	1. **DIMMs** 2. Microprocessors 3. System board
166-250-000 System Management: Failed (I2C cable is disconnected. Reconnect I2C cable between Remote Supervisor Adapter and system board.)	1. **Reseat I2C cable between the Advanced System Management Adapter (in PCI slot 1/J1) and the system board (J2).** 2. I2C cables. 3. Advanced System Management adapter. 4. System board.
166-260-000 System Management: Failed (Restart ASM Error. After restarting, ASM communication was lost. Unplug and cold boot to reset ASM.)	1. **Disconnect all server and option power cords from the server, wait 30 seconds, reconnect, and retry.** 2. Reseat the Remote Supervisor Adapter (in PCI slots 1/J1). 3. Remote Supervisor Adapter.
166-342-000 System Management: Failed (ASM adapter BIST indicate failed tests.)	1. **Ensure the latest firmware levels for Remote Supervisor Adapter and BIOS are installed.** 2. Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry. 3. Remote Supervisor Adapter.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
166-400-000 System Management: Failed (ISMP self test result failed tests: *x* where *x* = Flash, RAM, or ROM.)	1. **Reflash or update firmware for ISMP.** 2. System board.
180-XXX-000 (Diagnostics LED failure)	• **Run diagnostics panel LED test for the failing LED.**
180-XXX-001 (Failed front LED panel test)	1. **Operator information card** 2. System board
180-XXX-002 (Failed diagnostics LED panel test)	• **System board**
180-XXX-003 (Failed system board LED test)	• **System board**
180-XXX-005 (Failed SCSI backplane LED test)	1. **SCSI backplane** 2. SCSI backplane cable 3. System board
180-361-003 (Failed fan LED test)	1. **Fan** 2. System board
201-XXX-0nn (Failed memory test.)	1. **DIMM Location slots 1-4 where *nn* = DIMM location.** **Note:** *nn* 1=DIMM 1; 2=DIMM 2; 3=DIMM 3; 4=DIMM 4. 2. System board.
201-XXX-999 (Multiple DIMM failure, see error text)	1. **See error text for failing DIMMs.** 2. System board.
202-XXX-001 (Failed system cache test)	1. **Microprocessor 1** 2. System board
202-XXX-002 (Failed system cache test)	1. **Microprocessor 2** 2. System board
206-XXX-000 (Failed diskette drive test)	1. **Rerun the test using another diskette.** 2. Cable. 3. Diskette drive. 4. System board.
215-XXX-000 (Failed IDE CD-ROM drive test)	1. **Rerun the test using another CD-ROM.** 2. CD-ROM drive cables. 3. CD-ROM drive. 4. System board.
217-198-XXX (Could not establish drive parameters)	1. **Check cable and termination.** 2. SCSI backplane. 3. Hard disk drive.
217-XXX-000 (Failed hard disk drive test) **Note:** If RAID is configured, the hard disk drive number refers to the RAID logical array.	• **Hard disk drive 1**
217-XXX-001 (Failed hard disk test) **Note:** If RAID is configured, the hard disk number refers to the RAID logical array.	• **Hard disk drive 2**

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
264-XXX-0NN (Failed tape drive test)	1. **Tape cartridge, if user executed the Read/Write Tape Drive test (failure code of *xxx* = 256)** 2. SCSI or power cable connected to tape drive with SCSI ID *nn* 3. Tape drive with SCSI ID *nn* (refer to the Help and Service Information appendix of the tape drive’s User Guide) 4. System board or SCSI controller (run SCSI controller diagnostic to determine if the SCSI bus is functioning properly.)
264-XXX-999 (Errors on multiple tape drives, see error text for more info)	• **See error messages/text in the PC Doctor error log for detailed information on each individual tape drive error.**
301-XXX-000 (Failed keyboard test)	• **Keyboard** • System board.
405-XXX-000 (Failed Ethernet test on controller on the system board)	1. **Verify that Ethernet is not disabled in BIOS.** 2. System board.
405-XXX-00n (Failed Ethernet test on adapter in PCI slot *n*)	1. **Adapter in PCI slot *n*** 2. System board
405-XXX-a0n (Failed Ethernet test on adapter in PCI slot *a*)	1. **For *a*** = 0, system board 2. For *a* > 0, adapter in PCI slot *a*
415-XXX-000 (Failed Modem test)	1. **Cable** **Note:** Ensure modem is present and attached to server. 2. Modem 3. System board

Error symptoms

You can use the error symptom table to find solutions to problems that have definite symptoms.

If you cannot find the problem in the error symptom charts, go to “Starting the diagnostic programs” on page 24 to test the server.

If you have just added new software or a new option and your server is not working, do the following before using the error symptom charts:

- Remove the software or device that you just added.
- Run the diagnostic tests to determine if your server is running correctly.
- Reinstall the new software or new device.

In the following table, if the entry in the FRU/action column is a suggested action, perform that action; if it is the name of a component, reseat the component and replace it if necessary. The most likely cause of the symptom is listed first.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
CD-ROM drive problems	
Symptom	**FRU/action**
CD-ROM drive is not recognized.	1. **Verify that:** • The IDE channel to which the CD-ROM drive is attached (primary or secondary) is enabled in the Configuration/Setup Utility program. • All cables and jumpers are installed correctly. • The correct device driver is installed for the CD-ROM drive. 2. Run CD-ROM drive diagnostics. 3. CD-ROM drive.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Diskette drive problems	
Symptom	**FRU/action**
Diskette drive activity LED stays on, or the system bypasses the diskette drive.	1. **If there is a diskette in the drive, verify that:** • The diskette drive is enabled in the Configuration/Setup utility program. • The diskette is good and not damaged. (Try another diskette if you have one.) • The diskette is inserted correctly in the drive. • The diskette contains the necessary files to start the server. • The software program is working properly. • The cable is installed correctly (in the proper orientation). 2. Run diskette drive diagnostics. 3. Cable. 4. Diskette drive. 5. System board.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Expansion enclosure problems	
Symptom	**FRU/action**
The SCSI expansion enclosure used to work but does not work now.	1. **Verify that:** • The cables for all external SCSI options are connected correctly. • The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly. • Any external SCSI option is turned on. You must turn on an external SCSI option before turning on the server. 2. For more information, see your SCSI expansion enclosure documentation.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Hark disk drive problems	
Symptom	**FRU/action**
Not all drives are recognized by the hard disk drive diagnostic test (Fixed Disk test).	1. **Remove the first drive not recognized and try the hard disk drive diagnostic test again.** 2. If the remaining drives are recognized, replace the drive you removed with a new one.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Hark disk drive problems	
Symptom	**FRU/action**
System stops responding during hard disk drive diagnostic test.	1. **Remove the hard disk drive being tested when the server stopped responding and try the diagnostic test again.** 2. If the hard disk drive diagnostic test runs successfully, replace the drive you removed with a new one.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
General problems	
Symptom	**FRU/action**
Problems such as broken cover locks or indicator LEDs not working	• **Broken CRU/FRU**

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Intermittent problems	
Symptom	**FRU/action**
A problem occurs only occasionally and is difficult to detect.	1. **Verify that:** • All cables and cords are connected securely to the rear of the server and attached options. • When the server is turned on, air is flowing from the rear of the server at the fan grill. If there is no airflow, the fan is not working. This causes the server to overheat and shut down. • Ensure that the SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly. 2. Check the system error log.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Keyboard, mouse, or pointing-device problems	
Symptom	**FRU/action**
All or some keys on the keyboard do not work.	1. **Verify that:** • The keyboard cable is securely connected to the system, and the keyboard and mouse cables are not reversed. • The server and the monitor are turned on. 2. Keyboard. 3. System board.
The mouse or pointing device does not work.	1. **Verify that:** • The mouse or pointing-device cable is securely connected, and that the keyboard and mouse cables are not reversed. • The mouse device drivers are installed correctly. 2. Mouse or pointing device. 3. System board.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Memory problems	
Symptom	**FRU/action**
The amount of system memory displayed is less than the amount of physical memory installed.	1. **Verify that:** • The memory modules are seated properly. • You have installed the correct type of memory. • If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program. • All banks of memory on the DIMMs are enabled. The server might have automatically disabled a DIMM bank when it detected a problem or a DIMM bank could have been manually disabled. 2. Check POST error log for error message 289: • If the DIMM was disabled by a system-management interrupt (SMI), replace the DIMM. • If the DIMM was disabled by the user or by POST: a. Start the Configuration/Setup Utility program. b. Enable the DIMM. c. Save the configuration and restart the server. 3. DIMM. 4. System board.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Microprocessor problems	
Symptom	**FRU/action**
The server emits a continuous tone during POST. (The startup (boot) microprocessor is not working properly.)	1. **Verify that the startup microprocessor is seated properly.** 2. Startup microprocessor.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Monitor problems	
Symptom	**FRU/action**
Testing the monitor.	• **See the information that comes with the monitor** for adjusting and testing instructions. (Some IBM monitors have their own self-tests.)

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Monitor problems	
Symptom	**FRU/action**
The screen is blank.	1. **Verify that:** • The server power cord is plugged into the server and a working electrical outlet. • The monitor cables are connected properly. • The monitor is turned on and the Brightness and Contrast controls are adjusted correctly. • If the servers are C2T chained together, verify that: – The C2T chain cables are securely connected to the servers. – The C2T breakout cable is connected properly. – A server that is turned on is selected. **Important:** In some memory configurations, the 3-3-3 beep code might sound during POST followed by a blank display screen. If this occurs and the **Boot Fail Count** feature in the Start Options of the Configuration/Setup Utility program is set to **Enabled** (its default setting), you must restart the server three times to force the system BIOS to reset the CMOS values to the default configuration (memory connector or bank of connectors enabled). 2. If you have verified these items and the screen remains blank, replace: a. Monitor b. Video adapter, if installed c. System board
Only the cursor appears.	• See “Undetermined problems” on page 112.
The monitor works when you turn on the server but goes blank when you start some application programs.	1. **Verify that:** • The application program is not setting a display mode higher than the capability of the monitor. • The primary monitor cable is connected to the C2T device breakout cable. • You installed the necessary device drivers for the applications. 2. If you have verified these items and the screen remains blank, replace the monitor.
The screen is wavy, unreadable, rolling, distorted, or has screen jitter.	1. **If the monitor self-tests show the monitor is working properly, consider the location of the monitor.** Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.) Then move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor. **Notes:** a. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). b. Non-IBM monitor cables might cause unpredictable problems. c. An enhanced monitor cable with additional shielding is available for the 9521 and 9527 monitors. For information about the enhanced monitor cable, contact your IBM reseller or IBM marketing representative. 2. Video adapter, if installed. 3. System board.
Wrong characters appear on the screen.	1. If the wrong language is displayed, update the BIOS code with the correct language. 2. Video adapter, if installed. 3. System board.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Option problems	
Symptom	**FRU/action**
An IBM option that was just installed does not work.	1. **Verify that:** • The option is designed for the server (see the ServerProven list on the World Wide Web at http://www.ibm.com/pc/compat/). • You followed the installation instructions that came with the option. • The option is installed correctly. • You have not loosened any other installed options or cables. • You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration. 2. Option you just installed.
An IBM option that used to work does not work now.	1. **Verify that all of the option hardware and cable connections are secure.** 2. If the option comes with its own test instructions, use those instructions to test the option. 3. If the failing option is a SCSI option, verify that: • The cables for all external SCSI options are connected correctly. • The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly. • Any external SCSI option is turned on. You must turn on an external SCSI option before turning on the server. 4. Failing option.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Power problems	
Symptom	**FRU/action**
The server does not turn on.	1. **Verify that:** • The power cables are properly connected to the server. • The electrical outlet functions properly. • The type of memory installed is correct. • If you just installed an option, remove it, and restart the server. If the server now turns on, you might have installed more options than the power supply supports. 2. If LEDs for CPUs or VRMs are on, verify that: a. A VRM is installed if a second microprocessor is present. b. All microprocessors have the same speed. 3. Override front panel power button: a. Disconnect server power cords. b. Install a jumper on the force power-on jumper (J27). c. Reconnect power cords. If server turns on: a. Service processor error. b. Operator information card. If server does not turn on: • System board 4. See “Undetermined problems” on page 112.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Power problems	
Symptom	**FRU/action**
The server does not turn off.	1. **Verify whether you are using an ACPI or non-ACPI operating system.** If you are using a non-ACPI operating system: a. Press Ctrl+Alt+Delete. b. Turn off the system by holding the power-control button for 4 seconds. c. If server fails during BIOS POST and power-control button does not work, remove the AC power cord. 2. If the problem remains or if you are using an ACPI-aware operating system, suspect the system board.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Serial port problems	
Symptom	**FRU/action**
The number of serial ports identified by the operating system is less than the number of serial ports installed.	1. **Verify that:** • Each port is assigned a unique address by the Configuration/Setup Utility program and none of the serial ports is disabled. • The serial-port adapter, if you installed one, is seated properly. 2. Failing serial port adapter.
A serial device does not work. For more information about the serial port, see “Serial connector” on page 71.	1. **Verify that:** • The device is compatible with the server. • The serial port is enabled and is assigned a unique address. • The device is connected to the correct port (see “Input/output connectors” on page 69). 2. Failing serial device. 3. Serial adapter, if installed. 4. System board.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Software problem	
Symptom	**FRU/action**
Suspected software problem.	1. **To determine if problems are caused by the software, verify that:** • Your server has the minimum memory needed to use the software. For memory requirements, see the information that comes with the software. **Note:** If you have just installed an adapter or memory, you might have a memory address conflict. • The software is designed to operate on your server. • Other software works on your server. • The software that you are using works on another system. If you received any error messages when using the software program, see the information that comes with the software for a description of the messages and suggested solutions to the problem. 2. If you have verified these items and the problem remains, contact your place of purchase.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Universal Serial Bus (USB) port problems	
Symptom	**FRU/action**
A USB device does not work.	• **Verify that:** – You are not trying to use a USB device during POST if you have a standard (non-USB) keyboard attached to the keyboard port. **Note:** If a standard (non-USB) keyboard is attached to the keyboard port, the USB is disabled and no USB device will work during POST. – The correct USB device driver is installed. – Your operating system supports USB devices.

POST error codes

In the following error codes, *X* can be any number or letter.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
062 (Three consecutive startup failures using the default configuration.)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. System board. 4. Microprocessor.
101, 102 (System and processor error)	• **System board**
106 (System and processor error)	• **System board**
111 (Channel check error)	1. **Failing adapter** 2. DIMM 3. System board
114 (Adapter read-only memory error)	1. **Failing adapter.** 2. Run diagnostics.
129 (Internal cache error)	1. **Microprocessor** 2. Optional microprocessor (if installed) 3. System board
151 (Real time clock error)	1. **Run diagnostics.** 2. Battery. 3. System board.
161 (Real time clock battery error)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. System board.
162 (Device configuration error) **Note:** Be sure to load the default settings and any additional desired settings; then, *save the configuration*.	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. Failing device. 4. System board.
163 (Real-time clock error)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. System board.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
164 (Memory configuration changed.)	1. **Run the Configuration/Setup Utility program.** 2. DIMM. 3. System board.
165 (Service Processor failure)	• **System board**
175 (Hardware error)	• **System board**
176 (Computer cover or cable cover was removed without a key being used)	1. **Run the Configuration/Setup Utility program.** 2. System board.
177, 178 (Security hardware error)	1. **Run the Configuration/Setup Utility program.** 2. System board.
184 (Power-on password damaged)	1. **Run the Configuration/Setup Utility program.** 2. System board.
185 (Drive startup sequence information corrupted)	1. **Run the Configuration/Setup Utility program.** 2. System board.
186 (Security hardware control logic failed)	1. **Run the Configuration/Setup Utility program.** 2. System board.
187 (VPD serial number not set.)	1. **Set serial number in the Configuration/Setup Utility program.** 2. System board.
188 (Bad EEPROM CRC #2)	1. **Run the Configuration/Setup Utility program.** 2. System board.
189 (An attempt was made to access the server with invalid passwords)	• **Run the Configuration/Setup Utility program, and enter the administrator password.**
196 (Microprocessor mismatch error)	1. **Move microprocessor in socket 1 to socket 2, and move microprocessor in socket 2 to socket 1.** 2. Microprocessor.
201 (Memory test error.) If the server does not have the latest level of BIOS installed, update the BIOS to the latest level and run the diagnostic program again.	1. **DIMM** 2. System board
229 (Cache error)	1. **Microprocessor** 2. Optional microprocessor (if installed)
262 (DRAM parity configuration error)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. System board.
289 (DIMM disabled by POST or user)	1. **Run the Configuration/Setup Utility program, if the DIMM was disabled by the user.** 2. Disabled DIMM, if not disabled by user. 3. System board
301 (Keyboard or keyboard controller error)	1. **Keyboard** 2. System board
303 (Keyboard controller error)	• **System board**

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
602 (Invalid diskette boot record)	1. **Diskette** 2. Diskette drive 3. Cable 4. System board
604 (Diskette drive error)	1. **Run the Configuration/Setup Utility program and diagnostics.** 2. Diskette drive. 3. Drive cable. 4. System board.
605 (Unlock failure)	1. **Diskette drive** 2. Drive cable 3. System board
662 (Diskette drive configuration error)	1. **Run the Configuration/Setup Utility program and diagnostics.** 2. Diskette drive. 3. Drive cable. 4. System board.
762 (Coprocessor configuration error)	1. **Run the Configuration/Setup Utility program.** 2. Battery. 3. Microprocessor.
962 (Parallel port error)	1. **Disconnect the external cable on the parallel port.** 2. Run the Configuration/Setup Utility program. 3. System board.
11XX (System board serial port 1 or 2 error)	1. **Disconnect the external cable on the serial port.** 2. Run the Configuration/Setup Utility program. 3. System board.
1162 (Serial port configuration conflicts)	1. **Run the Configuration/Setup Utility program** and ensure that the IRQ and I/O port assignments needed by the serial port are available. 2. If all interrupts are being used by adapters, remove an adapter or force other adapters to share an interrupt.
1301 (I2C cable to Operator information panel not found)	1. **Cable** 2. Operator information card 3. Power switch assembly 4. System board
1302 (I2C cable from system board to power on and reset switches not found)	1. **Cable** 2. Power switch assembly 3. System board
1303 (I2C cable from system board to power backplane not found)	1. **Cable** 2. Power supply 3. System board
1304 (I2C cable to diagnostic LED board not found)	1. **Power switch assembly** 2. System board

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
1600 (The service processor is not functioning)	1. Do the following before replacing a FRU: a. Ensure that a jumper is not installed on service processor reset jumper (J39). b. Remove the ac power to the server, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, turn on the server. 2. System board.
1601 (The system is able to communicate to the service processor, but the service processor failed to respond at the start of POST.)	1. Do the following before replacing a FRU: a. Remove the ac power to the server, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, turn on the server. b. Flash update the system management processor. 2. Remote Supervisor Adapter, if installed. 3. System board.
1602 (Cable for optional service processor adapter not installed)	• **Disconnect all server and option power cords from server, wait 30 seconds, reconnect, and retry.**
1762 (Hard disk configuration error)	1. **Hard disk drive.** 2. Hard disk drive cables. 3. Run the Configuration/Setup Utility program. 4. SCSI backplane. 5. System board.
178X (Fixed disk error)	1. **Hard disk drive cables.** 2. Run diagnostics. 3. Hard disk drive. 4. System board.
1800 (No more hardware interrupt available for PCI adapter)	1. **Run the Configuration/Setup Utility program.** 2. Failing adapter. 3. System board.
1801 (No more ROM space available for PCI adapter)	1. **Run the Configuration/Setup Utility program.** 2. Remove adapter; then, disable BIOS on adapter and run the Configuration/Setup Utility program. 3. System board.
1962 (Drive does not contain a valid boot sector)	1. **Verify that a startable operating system is installed.** 2. Run diagnostics. 3. Hard disk drive. 4. SCSI backplane. 5. Cable. 6. System board.
2400 (Video controller test failure)	1. **Video adapter (if installed)** 2. System board
2462 (Video memory configuration error)	1. **Video adapter (if installed)** 2. System board

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
5962 (IDE CD-ROM drive configuration error)	1. **Run the Configuration/Setup Utility program.** 2. CD-ROM drive. 3. CD-ROM power cable. 4. IDE cable. 5. System board. 6. Battery.
8603 (Pointing-device error)	1. **Pointing device** 2. System board
0001200 (Machine check architecture error)	1. **Microprocessor 1** 2. Optional microprocessor 2 3. System board
00012000 (Microprocessor machine check)	1. **Microprocessor** 2. System board
00019501 (Microprocessor 1 is not functioning - check VRM and microprocessor LEDs)	1. **Microprocessor 1** 2. System board
00019502 (Microprocessor 2 is not functioning – check VRM and microprocessor LEDs)	1. **Microprocessor 2** 2. System board
00019701 (Microprocessor 1 failed)	1. **Microprocessor 1** 2. System board
00019702 (Microprocessor 2 failed)	1. **Microprocessor 2** 2. System board
00180100 (A PCI adapter has requested memory resources that are not available.)	1. **Reorder the adapters in the PCI slots. It is important that your startup device is positioned early in the startup-device order so that it is run by POST.** 2. Ensure that the PCI adapter and all other adapters are set correctly in the Configuration/Setup Utility program Utility program. If the memory resource settings are not correct, change the settings. 3. If all memory resources are being used, you might need to remove an adapter to make memory available to the PCI adapter. Disabling the adapter BIOS on the adapter might correct the error. (See the documentation provided with the adapter.)
00180200 (No more I/O space available for PCI adapter)	1. **Run the Configuration/Setup Utility program.** 2. Failing adapter. 3. System board.
00180300 (No more memory (above 1MB for PCI adapter))	1. **Run the Configuration/Setup Utility program.** 2. Failing adapter. 3. System board.
00180400 (No more memory (below 1MB for PCI adapter))	1. **Run the Configuration/Setup Utility program.** 2. Move the failing adapter to slot 1 or 2. 3. Failing adapter. 4. System board.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
00180500 (PCI option ROM checksum error)	1. **Remove failing PCI adapter.** 2. System board.
00180600 (PCI adapter self-test)	1. **Run the Configuration/Setup Utility program.** 2. Move the failing adapter to slot 1 or 2. 3. Failing adapter. 4. System board
00180700, 00180800 (General PCI error)	1. **System board** 2. PCI adapter
00181000 (PCI error)	1. **Adapter** 2. System board
01295085 (ECC checking hardware test error)	1. **System board** 2. Microprocessor
01298001 (System BIOS installed on this server does not support level of processor)	1. **Ensure all microprocessors have the same cache size.** 2. Microprocessor 1.
01298002 (System BIOS installed on this server does not support level of processor)	1. **Ensure all microprocessors have the same cache size.** 2. Microprocessor 2.
01298101 (System BIOS installed on this server does not support level of processor)	1. **Ensure all microprocessors have the same cache size.** 2. Microprocessor 1.
01298102 (System BIOS installed on this server does not support level of processor)	1. **Ensure all microprocessors have the same cache size.** 2. Microprocessor 2.
01298200 (Microprocessor speed mismatch)	1. **Ensure all microprocessors are the same speed.** 2. Microprocessor.
I9990301 (Hard disk sector error)	1. **Hard disk drive** 2. SCSI backplane 3. Cable 4. System board
I9990305 (Hard disk sector error, no operating system installed)	1. **Install operating system to hard disk.**
I9990650 (AC power has been restored)	1. **Check cable.** 2. Check for interruption of power. 3. Power cable.

Service processor error codes

When viewed from POST, service processor error codes will appear in hexadecimal form (generally beginning with A2, A3, A4, A5, A6, A7, AD, AE, or E1), unless a Remote Supervisor Adapter is installed. However, when viewed from the System Error Log, the messages will appear as text. To determine a possible error condition for the service processor, see the System Error Log (see “Viewing error logs from the diagnostic programs” on page 24).

ServeRAID error codes

In the following error codes, *x* can be any number or letter.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
1*xxx* (Microcode checksum error)	1. ServeRAID controller
2*xxx* (Code DRAM error)	1. Install download jumpers, flash latest level BIOS and firmware for controller. Remove jumpers. 2. ServeRAID controller.
3000-31*XX* (Code DRAM error)	1. Install download jumpers, flash latest level BIOS and firmware for controller. Remove jumpers. 2. ServeRAID controller.
3200 (Code DRAM error)	1. Install download jumpers, flash latest level BIOS code and firmware for controller. Remove jumpers. 2. ServeRAID controller.
3300 (ServeRAID-5i only)	1. Install ServeRAID-5i controller in an extended PCI expansion slot. See the documentation that came with the server for more information.
3E20 (ServeRAID-5i only)	1. Remove the ServeRAID-5i controller from its slot and install it in the proper PCI option slot. 2. Verify that the ServeRAID-5i controller is supported in this server. 3. ServeRAID-5i controller. 4. System board.
3E2x	1. Reseat the ServeRAID controller. 2. Flash latest level of BIOS code and firmware for controller. 3. ServeRAID-5i controller. 4. Integrated RAID controller on server).
4*xxx* thru 5*xxx* (Code DRAM error)	1. Install download jumpers, flash latest level BIOS code and firmware for controller; then, remove jumpers. 2. ServeRAID controller.
6*xxx* (Cache DRAM error) (ServeRAID-4H only)	1. Reseat daughter card. 2. Install download jumpers, flash latest level BIOS code and firmware for controller; then, remove jumpers. 3. ServeRAID controller.
7*xxx* thru 8*xxx* (Host/local PCI bus interface error)	1. Flash latest level of BIOS code and firmware for controller. 2. If ServeRAID-4x controller, replace controller. 3. If ServeRAID-5i controller, integrated RAID controller on the server.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Error code/symptom	**FRU/action**
9003	1. Flash latest level of BIOS code and firmware for controller. 2. Confirm that this controller is a supported option for this system. 3. ServeRAID controller. 4. Integrated RAID controller on the server).
9*xxx* thru BZ*xx* (SCSI bus error caused by cables, termination, defective drives, etc.). *Z* refers to the specific channel or channels that cause the error.	1. Follow indications at “POST (ISPR) error procedures”. Follow those instructions before continuing with the next steps listed in this index. 2. SCSI cable. 3. SCSI backplane. 4. Hard disk drive. 5. ServeRAID controller.
EFFE (Firmware code corrupt or download jumpers are in place)	1. Flash latest level BIOS and firmware for controller; then, remove jumpers. 2. ServeRAID controller.
FFFF or other code not listed	1. Follow indications at “POST (ISPR) error procedures”. 2. SCSI cable. 3. SCSI backplane. 4. Hard disk drive. 5. ServeRAID controller.

POST (ISPR) error procedures

Use the ISPR error procedures to help you solve ServeRAID problems. A complete list of error codes is listed at “ServeRAID error codes” on page 105.

Note: Where the ISPR Error Procedures refer to a SCSI backplane, see the chapter of this publication that concerns service replaceable units.

EF10 (Default ISPR)

1. No ISPR error present.

9*ZXX* thru B*ZXX* (SCSI bus error caused either by cables, termination, defective drives, etc.)

1. Isolate between SCSI subsystem and controller by disconnecting all SCSI cables from suspect card, and reboot.

   CAUTION:
   Do not press F5. Doing so changes the server’s configuration.

   If an ISPR error is still present, perform the following actions until the error is no longer present:

   a. Reseat the controller

   b. Replace the controller

   Notes:

   a. SCSI channel cable details, if any, appear elsewhere in this publication.

b. The adapter/controller detects a configuration change. **Do not** choose **Save Changes**. Instead, press **F10** to bypass any options to this effect.

2. If ISPR error is **EF10** after disconnecting cables:
   a. Identify which channel is causing the error by the second digit (Z) of the original ISPR code as indicated in the following table:

      Note: ServeRAID-4H controllers have 4 channels; ServeRAID-4L and -4Lx controllers have only one channel; and ServeRAID-4M and -4Mx controllers have 2 channels. ServeRAID-5i controllers have no channels. The ServeRAID-5i uses the channel connectors of the server's onboard integrated SCSI controller.

Table 8. SCSI identifier

SCSI Channel Code (z)	Descriptions
1	Channel 1
2	Channel 2
3	Channel 1 & 2
4	Channel 3
5	Channel 1 & 3
6	Channel 2 & 3
7	Channel 1, 2, & 3
8	Channel 4
9	Channel 1 & 4
A	Channel 2 & 4
B	Channel 1, 2, & 4
C	Channel 3 & 4
D	Channel 1, 3, & 4
E	Channel 2, 3, & 4
F	Channel 1, 2, 3, & 4

   b. Confirm that the channel(s) identified from the error in step 2a is (are) the cause of the error by verifying that the error presents itself *only* when the offending channel is reconnected.
   c. Check termination of identified channel.

      Note: SCSI channel termination details, if any, appear elsewhere in this publication.
   d. Check for proper backplane jumper configuration.

      Note: SCSI channel jumper details, if any, appear elsewhere in this publication.
   e. Check for proper cabling configuration in systems that use DASD status cables. Reconnect all cables removed in step 1 on page 106.
   f. Disconnect one drive at a time attached to the channel identified in step 2a; then, reboot to determine which drive is causing the error.
   g. Replace SCSI cable.
   h. Replace SCSI backplane.

FFFF or other code not listed

1. Place download jumpers on the controller and try to flash the firmware code to the card.
2. Isolate between SCSI subsystem and controller by disconnecting all SCSI cables attached to the suspect card, and reboot.

   CAUTION:
   Do not press F5. Doing so will change the server's configuration.

   If ISPR code is **EF10** after disconnecting cables, follow the steps below until the error is eliminated:

   a. Identify which channel is causing the error by reconnecting cables one at a time and rebooting until the error returns.

   b. Check termination of identified channel in step 2a.

      Note: SCSI channel termination details, if any, appear elsewhere in this publication.

   c. Disconnect one drive at a time attached to channel identified in step 2a and reboot each time to determine which drive is causing the problem.

   d. Replace SCSI cable attached to channel identified in step 2a.

   e. Replace backplane attached to channel identified in step 2a.
3. If original ISPR code is still present after disconnecting all SCSI cables and rebooting, perform the following actions until the error is no longer present:
   - Reseat the controller
   - Replace the controller

SCSI error codes

Error code	FRU/action
All SCSI Errors One or more of the following might be causing the problem: • A failing SCSI device (adapter, drive, controller) • An improper SCSI configuration or SCSI termination jumper setting • Duplicate SCSI IDs in the same SCSI chain • A missing or improperly installed SCSI terminator • A defective SCSI terminator • An improperly installed cable • A defective cable	1. **External SCSI devices must be turned on before you turn on the server.** 2. Make sure that the cables for all external SCSI devices are connected correctly. 3. If you have attached an external SCSI device to the server, make sure the external SCSI termination is set to automatic. 4. Make sure that the last device in each SCSI chain is terminated correctly. 5. Make sure that the SCSI devices are configured correctly.

Temperature error messages

Note: See "System" on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
DASD Over Temperature (level-critical; direct access storage device bay *x* was over temperature)	• **Ensure that the system is being properly cooled**; see "System reliability considerations" on page 39.

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
DASD Over recommended Temperature (sensor *x*) (level-warning; DASD bay *x* had over temperature condition)	• **Ensure that the system is being properly cooled**; see “System reliability considerations” on page 39.
DASD under recommended temperature (sensor *x*) (level-warning; direct access storage device bay *x* had under temperature condition)	• **Ambient temperature must be within normal operating specifications**; see “Features and specifications” on page 2.
DASD Over Temperature (level-critical; sensor for DASD1 reported temperature over recommended range)	• **Ensure system is being properly cooled**; see “System reliability considerations” on page 39.
Power supply *x* Temperature Fault (level-critical; power supply *x* had over temperature condition)	1. **Ensure system is being properly cooled;** see “System reliability considerations” on page 39. 2. Replace power supply *x*
System board is over recommended temperature (level-warning; system board is over recommended temperature)	1. **Ensure system is being properly cooled**; see “System reliability considerations” on page 39. 2. Replace the system board.
System board is under recommended temperature (level-warning; system board is under recommended temperature)	• **Ambient temperature must be within normal operating specifications**; see “Features and specifications” on page 2.
System over temperature for CPU *x* (level-warning; CPU x reporting over temperature condition)	• **Ensure system is being properly cooled;** see“System reliability considerations” on page 39.
System under recommended CPU *x* temperature (level-warning; system reporting under temperature condition for CPU x)	• **Ambient temperature must be within normal operating specifications**; see “Features and specifications” on page 2.

Fan error messages

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
Fan *x* failure (level-critical; fan *x* had a failure)	1. **Check connections to fan *x*.** 2. Replace fan *x*.
Fan *x* fault (level-critical; fan *x* beyond recommended RPM range)	1. **Check connections to fan *x*.** 2. Replace fan *x*.
Fan *x* outside recommended speed action	1. **Replace fan *x*.**

Power error messages

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
Power supply *x* current share fault (level-critical; excessive current demand on power supply *x*)	• **Replace power supply *x*.**

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
Power supply *x* DC good fault (level-critical; power good signal not detected for power supply *x*)	• **Replace power supply *x*.**
Power supply *x* temperature fault	• **Replace power supply *x*.**
Power supply *x* removed	• **No action required - information only**.
Power supply *x* fan fault (level-critical; fan fault in power supply *x*)	• **Replace power supply *x*.**
Power supply *x* 12 V fault (level-critical; overcurrent condition detected)	• **See “Power checkout” on page 31.**
Power supply *x* 3.3 V fault (level-critical; 3.3 V power supply *x* had an error)	• **See “Power checkout” on page 31.**
Power supply *x* 5 V fault (level-critical; 5 V power supply *x* had an error)	• **See “Power checkout” on page 31.**
System running non-redundant power (level-noncritical; system does not have redundant power)	1. **Add another power supply.** 2. Remove options from system. 3. System can continue to operate without redundancy protection if steps1 and 2 are not followed.
System under recommended voltage for *x* (level-warning; indicated voltage supply under nominal value; value for *x* can be +12, -12, or +5)	1. **Check connections to the power subsystem.** 2. Power supply.

System shutdown

Refer to the following tables when experiencing system shutdown related to voltage or temperature problems.

Voltage related system shutdown

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
System shutoff due to *x* current over max value (level-critical; system drawing too much current on voltage *x* bus)	• **See “Power checkout” on page 31.**
System shutoff due to *x* V over voltage (level-critical; system shutoff due to *x* supply over voltage)	1. **Check the power-supply connectors** 2. Power supply.
System shutoff due to *x* V under voltage (level-critical system shutoff due to *x* supply under voltage)	1. **Check the power-supply connectors.** 2. Power supply.
System shutoff due to VRM x over voltage	• **Replace VRM *x*.**
System shutoff due to excessive (< 240 VA) loading	1. **See “Power checkout” on page 31.** 2. Cycle ac on/off.

Temperature related system shutdown

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
System shutoff due to board over temperature (level-critical; board is over temperature)	1. **Ensure that the system is being properly cooled**; see “System reliability considerations” on page 39″. 2. Replace board.
System shutoff due to CPU x over temperature (level-critical; CPU *x* is over temperature)	1. **Ensure that the system is being properly cooled**; see “System reliability considerations” on page 39. 2. Replace CPU *x*.
System shutoff due to CPU *x* under temperature (level-critical; CPU *x* is under temperature)	• **Ambient temperature must be within normal operating specifications**; see “Features and specifications” on page 2.
System shutoff due to DASD temperature (sensor *x*) (level-critical; DASD area reported temperature outside recommended operating range)	• **Ensure that the system is being properly cooled**; see “System reliability considerations” on page 39.
System shutoff due to high ambient temperature (level-critical; high ambient temperature)	• **Ambient temperature must be within normal operating specifications**; see “Features and specifications” on page 2.
System shutoff due to system board under temperature (level-critical; system board is under temperature)	• **Ambient temperature must be within normal operating specifications**; see “Features and specifications” on page 2.

DASD checkout

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
Hard drive *x* removal detected (level-critical; hard drive *x* has been removed)	• **Information only, take action as appropriate.**

Host built-in self test (BIST)

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Message	**Action**
Host fail (level-informational; built-in self-test for the host failed)	1. **Reseat the microprocessor.** 2. Reseat the VRM. 3. Replace the microprocessor CPU.

Bus fault messages

Note: See “System” on page 116 to determine which components should be replaced by a field service technician.	
Bus fault messages	**Message Action**
Failure reading 12C device. Check devices on bus 0.	1. **If installed, reseat the I2C cable between Remote Supervisor Adapter (in PCI slot 1/J1) and system board (J2).** 2. Memory DIMMs. 3. System board.
Failure reading 12C device. Check devices on bus 1.	1. **Reseat the I2C cable between the operator information panel and system board (J10).** 2. Operator information card. 3. System board.
Failure reading 12C device. Check devices on bus 2.	1. **Reseat the cable between system board and the power supply.** 2. Power supply. 3. System board.
Failure reading 12C device. Check devices on bus 3.	1. **Reseat the cable between the SCSI backplane and connector (J8) of system board.** 2. SCSI backplane. 3. System board.
Failure reading I2C device. Check device on bus 4.	• **System board**

Undetermined problems

Use the information in this section if the diagnostic tests did not identify the failure, the devices list is incorrect, or the system is inoperative.

Notes:

1. Damaged data in CMOS can cause undetermined problems.
2. Damaged data in BIOS code can cause undetermined problems.

Check the LEDs on all the power supplies. If the LEDs indicate the power supplies are working correctly, complete the following steps:

1. Turn off the server.
2. Be sure the server is cabled correctly.
3. Remove or disconnect the following devices (one at a time) until you find the failure (turn on the server and reconfigure each time):
   - Any external devices
   - Surge suppressor device (on the server)
   - Modem, printer, mouse, or non-IBM devices
   - Each adapter
   - Drives
   - Memory modules (minimum requirement = two 256 MB DIMMs)

   Note: Minimum operating requirements are:
   a. Power supply
   b. System board
   c. One microprocessor and VRM
   d. Memory (with a minimum of two 256 MB DIMMs)
4. Turn on the server. If the problem remains, suspect the following FRUs in the order listed:

- Power supply
- System board

Notes:

1. If the problem goes away when you remove an adapter from the system and replacing that adapter does not correct the problem, suspect the system board.
2. If you suspect a networking problem and all the system tests pass, suspect a network cabling problem external to the system.

Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Microprocessor or hard disk upgrades
- Failure symptom
  - Do diagnostics fail?
  - What, when, where, single, or multiple systems?
  - Is the failure repeatable?
  - Has this configuration ever worked?
  - If it has been working, what changes were made prior to it failing?
  - Is this the original reported failure?
- Diagnostics version
  - Type and version level
- Hardware configuration
  - Print (print screen) configuration currently in use
  - BIOS level
- Operating system software
  - Type and version level

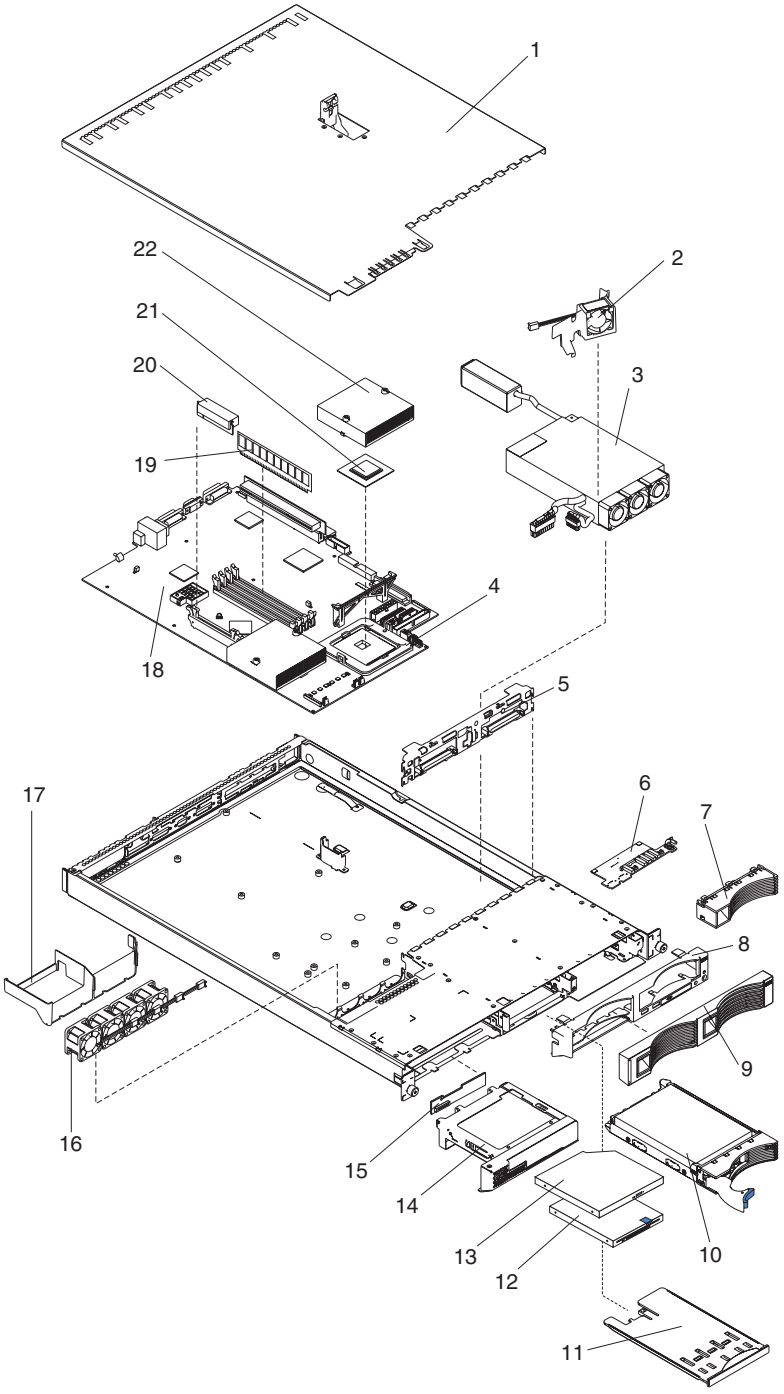
Note: To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same diagnostics code (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operation system control files

Comparing the configuration and software set-up between ″working″ and ″non-working″ systems will often lead to problem resolution.

Chapter 7. Parts listing for the xSeries 335

This parts listing supports the xSeries 335 (Type 8676, Type 8830).



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System

Note: Field replaceable units (FRUs) should be serviced only by qualified field service technicians. Customer replacement units can be replaced by the customer.

Index	System (xSeries 335, Type 8676 and Type 8830, Models 41X, 42X, 61X, 62X)	FRU No.	CRU/FRU
1	Cover, top (all models)	24P0708	CRU
2	Fan, DASD (all models)	00N6991	CRU
3	Power supply, 331W (models 41X, 42X, 61X, 62X)	49P2013	FRU
4	Retention module, heatsink (all models)	24P0836	FRU
5	Hot-swap SCSI backplane (all models)	32P1932	FRU
6	Operator information card (all models)	48P9086	FRU
7	Filler, bezel (all models)	06P6245	CRU
8	Bezel, hot swap trim (all models)	24P0720	CRU
9	Bezel, non-hot swap trim (all models)	24P0723	CRU
10	40GB IDE drive, 7200 RPM (models 42X, 62X)	19K1568	CRU
11	USB tray (all models)	32P0580	CRU
12	Diskette drive, 12.7, 3 MODE (all models)	36L8645	CRU
13	CD-ROM drive, 24X (primary) (all models)	06P5263	CRU
13	CD-ROM drive, 24X (all models)	33P3231	CRU
14	Bracket, CD-ROM drive/diskette drive (all models)	32P1925	CRU
15	Interposer card (all models)	48P9028	CRU
16	Fan, microprocessor (all models)	24P1118	CRU
17	Baffle (all models)	24P0742	CRU
18	System board (all models)	48P9077	FRU
19	Memory, 256 PC2100 ECC (all models)	09N4306	CRU
20	VRM card, 9.0 1U/13A (all models)	49P2085	CRU
21	Microprocessor, 400/2.0-0K (models 41X, 42X)	32P1921	CRU
21	Microprocessor, 400/2.4-0K (models 61X, 62X)	32P1923	CRU
22	Heatsink (all models)	24P0799	CRU
	Battery, 3.0V (all models)	33F8354	CRU
	Fan assembly duct, 40x20 (all models)	24P0892	CRU
	Tool-less rail kit, 1U (all models)	24P1121	CRU
	Service label (all models)	24P0798	CRU
	Nameplate, @server xSeries (all models)	33P2205	CRU
	Chassis (all models)	32P1924	FRU
	Rail kit, non-hot swap hard disk drive (all models)	32P1928	FRU
	Riser assembly, 3.5V (all models)	25P3359	CRU
	Jumper cord (all models)	36L8886	CRU
	Connector, -48V (all models)	01R1199	CRU
	Cable, CD-ROM drive power (all models)	24P0867	CRU
	Cable, CD-ROM signal (all models)	24P0851	CRU
	Cable, hard disk drive power, fixed 2-drop (all models)	24P0865	CRU
	Cable, switch and USB (all models)	24P0853	CRU
	Cable, diskette drive signal (all models)	24P0790	CRU
	Cable, IDE drive (all models)	24P0788	CRU
	Cable, hot-swap SCSI assembly (all models)	24P0786	FRU
	Cable, hard disk drive 4-pin power (all models)	24P0622	CRU
	Cable, hard disk drive backplane to system board (all models)	00N6988	FRU

Index	System (xSeries 335, Type 8676 and Type 8830, Models 41X, 42X, 61X, 62X)	FRU No.	CRU/FRU
	Miscellaneous parts kit – contains: CD-ROM drive spring rod (1); diskette drive spring rod (1); screws (10); PCI card support bracket (1); icon light pipe (1); rear light pipe (1); CD-ROM drive blank bezel (1); diskette drive blank bezel (1); slotted M3x5 screws (18); I/O bracket (2) fan bracket (1); 40 mm by 20 mm fan bracket (1) (all models)	32P1926	FRU
	Power cord (all models)	6952300	CRU

Keyboard CRUs

Keyboard	CRU No.
US English	37L2551
French Canadian	37L2552
LA Spanish	37L2553
Arabic	37L2555
Belgium/French	37L2556
Belgium/UK	37L2557
Bulgarian	37L2558
Czech	37L2559
Danish	37L2560
Dutch	37L2561
French	37L2562
German	37L2563
Greek	37L2564
Hebrew	37L2565
Hungarian	37L2566
Korean	02K0901
Iceland	37L2567
Italy	37L2568
Norwegian	37L2569
Polish	37L2570
Portuguese	37L2571
Romanian	37L2572
Russian	37L2573
Serbian/Cyrillic	37L2574
Slavic	37L2575
Spanish	37L2576
Swedish/Finn	37L2577
Swiss, French/German	37L2578
Turkish	37L2579
Turkish	37L2580
UK English	37L2581
Yugosl/Lat	37L2582
US English-EMEA	37L2583
Chinese/US	37L2585
Thailand	37L2587
French Canadian	37L0913

Power cord CRUs

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
13F9940	Argentina, Australia, China (PRC), New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, China (Macau S.A.R.), Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
13F9997	Denmark
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
14F0033	Antigua, Bahrain, Brunei, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dubai, Fiji, Ghana, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Ethiopia, Italy, Libya, Somalia
14F0087	Israel
1838574	Thailand

IBM power cord part number	Used in these countries and regions
6952301	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your xSeries or IntelliStation system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.
- Go to the IBM Support Web site at http://www.ibm.com/pc/support/ to check for technical information, hints, tips, and new device drivers.
- Use an IBM discussion forum on the IBM Web site to ask questions.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, README files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/pc/support/ and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is http://www.ibm.com/eserver/xseries/. The address for IBM IntelliStation information is http://www.ibm.com/pc/intellistation/.

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You can find service information for your IBM products, including supported options, at http://www.ibm.com/pc/support/. If you click **Profile** from the support page, you can create a customized support page. The support page has many sources of information and ways for you to solve problems, including:

- Diagnosing problems, using the IBM Online Assistant
- Downloading the latest device drivers and updates for your products
- Viewing Frequently Asked Questions (FAQ)
- Viewing hints and tips to help you solve problems
- Participating in IBM discussion forums
- Setting up e-mail notification of technical updates about your products

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to http://www.ibm.com/services/sl/products/.

For more information about Support Line and other IBM services, go to http://www.ibm.com/services/, or go to http://www.ibm.com/planetwide/ for support telephone numbers.

Hardware service and support

You can receive hardware service through IBM Integrated Technology Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. Go to http://www.ibm.com/planetwide/ for support telephone numbers.

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix B. Related service information

Note: The service procedures are designed to help you isolate problems. They are written with the assumption that you have model-specific training on all computers, or that are familiar with the computers, functions, terminology, and service information provided in this manual.

Safety information

The following section contains the safety information that you need to be familiar with before servicing an IBM computer.

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

  Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

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Electrical safety

CAUTION:
Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important: Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.

    Remember: Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

    Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

  Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators

  and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - Use caution; do not become a victim yourself.
  - Switch off power.
  - Send another person to get medical aid.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Turn off the computer. Disconnect the power cord.
3. Check the power cord for:

a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
b. The power cord should be the appropriate type as specified in the parts listings.
c. Insulation must not be frayed or worn.

4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the server, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD-protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those in the following list, to provide protection that meets the specific service requirement.

  Note: The use of a grounding system is desirable but not required to protect against ESD damage.

  – Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
  – Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
  – Use the round ground-prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Notice for customers in the State of California

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

Safety notices (multilingual translations)

The caution and danger safety notices in this section are provided in the following languages:

- English
- Brazilian/Portuguese
- Chinese
- French
- German
- Italian
- Japanese
- Korean
- Spanish

Important: All caution and danger statements in this IBM documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in this section.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in this section under statement 1.

Be sure to read all caution and danger statements before performing any of the instructions.

- Statement 1

DANGER

Electrical current from power, telephone and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**

- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect	To Disconnect
1. Turn everything OFF. 2. First, attach all cables to devices. 3. Attach signal cables to connectors. 4. Attach power cords to outlet. 5. Turn device ON.	1. Turn everything OFF. 2. First, remove power cords from outlet. 3. Remove signal cables from connectors. 4. Remove all cables from devices.

- Statement 2

CAUTION:
When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

Dispose of the battery as required by local ordinances or regulations.

- Statement 3

CAUTION:
When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER: Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

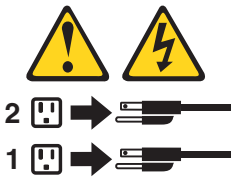
- Statement 4

≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting.

- Statement 5

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



- Statement 10

CAUTION:

Do not place any object weighing more than 82 kg (180 lbs.) on top of rack-mounted devices.

Importante:

Todas as instruções de cuidado e perigo da IBM documentation começam com um número. Este número é utilizado para fazer referência cruzada de uma instrução de cuidado ou perigo no idioma inglês com as versões traduzidas das instruções de cuidado ou perigo encontradas nesta seção.

Por exemplo, se uma instrução de cuidado é iniciada com o número 1, as traduções para aquela instrução de cuidado aparecem nesta seção sob a instrução 1.

Certifique-se de ler todas as instruções de cuidado e perigo antes de executar qualquer operação.

Instrução 1

PERIGO

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque:

- Não conecte ou desconecte cabos e não realize instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Conecte todos os equipamentos ao qual esse produto será conectado a tomadas corretamente instaladas.
- Sempre que possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue qualquer equipamento quando existir evidência de danos por fogo, água ou na estrutura.
- Desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas dos dispositivos, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte cabos conforme descrito na seguinte tabela, ao instalar ou movimentar este produto ou os dispositivos conectados, ou ao abrir suas tampas.

Para Conectar:	**Para Desconectar:**
1. DESLIGUE Tudo. 2. Primeiramente, conecte todos os cabos aos dispositivos. 3. Conecte os cabos de sinal aos conectores. 4. Conecte os cabos de alimentação às tomadas. 5. LIGUE os dispositivos.	1. DESLIGUE Tudo. 2. Primeiramente, remova os cabos de alimentação das tomadas. 3. Remova os cabos de sinal dos conectores. 4. Remova todos os cabos dos dispositivos.

Instrução 2

CUIDADO:

Ao substituir a bateria de lítio, utilize apenas uma bateria IBM, Número de Peça 33F8354 ou uma bateria de tipo equivalente, recomendada pelo fabricante. Se o seu sistema possui um móídulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de mídulo, do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Para descartar a bateria, entre em contato com a área de atendimento a clientes IBM, pelo telefone (011) 889-8986, para obter informações sobre como enviar a bateria pelo correio para a IBM.

Instrução 3

PRECAUCIÓN:

Quando produtos a laser (unidades de CD-ROM, unidades de DVD, dispositivos de fibra ítica, transmissores, etc.) estiverem instalados, observe o seguinte:

- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Nenhuma peça localizada no interior do dispositivo pode ser consertada.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.

PERIGO

Alguns produtos a laser contêm um diodo laser da Classe 3A ou Classe 3B embutido. Observe o seguinte:

Radiação de laser quando aberto. Não olhe diretamente para o raio a olho nu ou com instrumentos íticos, e evite exposição direta ao raio.

Instrução 4

≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

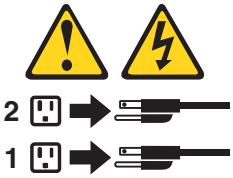
CUIDADO:

Ao levantar a máquina, faça-o com segurança.

Instrução 5

CUIDADO:

Os botões Liga/Desliga localizados no dispositivo e na fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia elétrica.



CUIDADO:

Instrução 10

CUIDADO:

Não coloque nenhum objeto com peso superior a 82 kg (180 lbs.) sobre dispositivos montados em rack.

重要：

Server Library 中的所有提醒和危险条款前都有一个数字标识。该数字是用来交叉引用一个英文的提醒和危险条款及本部分中的与之对应的已翻译成其它文字的提醒和危险条款。

例如，如果一个提醒条款前的数字为 1，则本部分中相应的译文也带有标号 1。

在执行任何指示的操作之前，请确保您已经阅读了全部提醒和危险条款。

声明 1

危险

电源、电话和通信电缆中带有危险电流。

为避免电击：

雷电期间不要拆接电缆或安装、维修及重新配置本产品。

将所有电源线连接至正确布线并已安全接地的电源插座上。

将应与本产品连接的所有设备连接至正确布线的插座上。

尽量只使用单手拆接信号电缆。

有水、火及结构损坏迹象时，请勿打开任何设备。

除非在安装配置过程中有明确指示，否则，打开设备机盖前应先断开与电源线、远程通信系统、网络和调制解调器的所有连接。

安装、移动或打开本产品及其附带设备的机盖时，应按下表所述连接和断开电缆。

连接时：	断开连接时：
1. 关闭所有设备。	1. 关闭所有设备。
2. 首先将所有电缆连接至设备。	2. 首先从插座中拔出电源线。
3. 将信号电缆连接至接口。	3. 从接口上拔下信号电缆。
4. 将电源线连接至插座。	

声明 2

警告：

更换锂电池时，只能使用 IBM 产品号 33F8354 或者是厂商推荐的等同类型的电池。

如果系统模块中含有锂电池，则只能使用同一厂商制造的同一类型的模块进行更换。电池中含有锂，如果使用、拿放或处理不当，可能会发生爆炸。

请勿对电池进行下列操作：
扔入或浸入水电 °
加热超过 100 （212 F）
进行修理或分解
请按本地法规要求处理电池。

声明 3

警告：

安装激光产品（如 CD-ROM、DVD 驱动器、光纤设备或送话器）时，应注意以下事项：

不要拆除外盖。拆除激光产品的外盖可能会导致激光辐射的危险，本设备中没有用户可维修的部件。

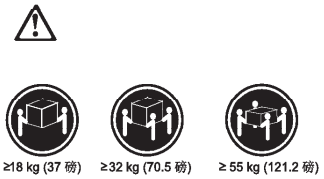
非此处指定的其它控制、调整或与性能有关的操作都有可能导致激光辐射的危险。

危险

某些激光产品中包含内嵌的 3A 级或 3B 级激光二极管。请注意以下事项。

打开时会产生激光辐射。不要直视光束，不要使用光学仪器直接观看光束，避免直接暴露于光束之下。

声明 4



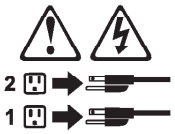
警告：

抬起时请采用安全操作方法。

声明 5

警告：

使用设备上的电源控制按钮和电源上的开关都不能断开本设备上的电流。另外，本设备可能带有多条电源线。如要断开设备上的所有电流，请确保所有电源线均已与电源断开连接。



声明 6

警告：

如果在电源线连接设备的一端安装了固定松紧夹，则必须将电源线的另一端连接至使用方便的电源。

声明 7

警告：

如果设备带有外门，则在移动或抬起设备前应将其拆除或固定以避免造成人员伤害。外门支撑不了设备的重量。

声明 8

警告：
不要拆除电源外盖或贴有下列标签的任何部件。

贴有此标签的组件内部存在高电压、高电流的危险。这些组件中没有用户可维修的部件。如果怀疑其中的部件存在问题，应与服务技术人员联系。

声明 9

警告：

为避免人员伤害，拆除设备上的风扇前应拔下热插拔风扇电缆。

声明 10

警告：

机柜安装的设备上面不能放置重于 82kg（180 磅）的物品。

> 82 kg (180 磅)

声明 11

警告：

下面的标签表明附近有锋利的边、角或接头。

声明 12

警告：
下面的标签表明附近有高热表面。

重要資訊：

Server Library 中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用，英文「注意」或「危險」聲明可在本節中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在本節的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

聲明 1

危險

電源、電話及通信電纜上所產生的電流均有危險性。

欲避免電擊危險：

- 在雷雨期間，請勿連接或切斷本產品上的任何電纜線，或安裝、維修及重新架構本產品。
- 請將電源線接至接線及接地正確的電源插座。
- 請將本產品隨附的設備連接至接線正確的插座。
- 儘可能使用單手來連接或切斷信號電纜線。
- 當設備有火燒或泡水的痕跡，或有結構性損害時，請勿開啓該設備的電源。
- 在安裝及架構之時，若非非常熟悉，在開啓裝置蓋子之前，請切斷電源線、電信系統、網路及數據機。
- 在安裝、移動本產品或附加裝置，或開啓其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：	切斷：
1. 關閉所有開關。	1. 關閉所有開關。
2. 先將所有電纜線接上裝置。	2. 先自電源插座拔掉電源線。
3. 將信號電纜接上接頭。	3. 拔掉接頭上的所有信號電纜。
4. 再將電源線接上電源插座。	4. 再拔掉裝置上的所有電纜線。
5. 開啓裝置的電源。	

聲明 2

注意：

更換鋰電池時，只可使用 IBM 零件編號 33F8354 的電池，或製造商建議之相當類型的電池。若系統中具有包含鋰電池的模組，在更換此模組時，請使用相同廠商製造的相同模組類型。如未正確使用、處理或丟棄含有鋰的電池時，可能會引發爆炸。

請勿將電池：

- 丟入或浸入水中
- 加熱超過 100 ℃ (212 ℉)
- 修理或拆開

請遵照當地法令規章處理廢棄電池。

聲明 3

注意：

安裝雷射產品 (如 CD-ROM、DVD 光碟機、光纖裝置或發射器) 時，請注意下列事項：

– 請勿移開蓋子。移開雷射產品的蓋子，您可能會暴露於危險的雷射輻射之下。裝置中沒有需要維修的組件。
– 不依此處所指示的控制、調整或處理步驟，您可能會暴露於危險的輻射之下。

危險

有些雷射產品含有內嵌式 Class 3A 或 Class 3B 雷射二極體。請注意下列事項：

開啓時會產生雷射輻射。請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光束下。

聲明 4

≥ 18 公斤 (37 磅)

≥ 32 公斤 (70.5 磅)

≥ 55 公斤 (121.2 磅)

注意：

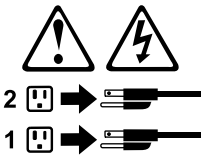
抬起裝置時，請注意安全措施。

聲明 5

注意：

裝置上的電源控制按鈕及電源供應器上的電源開關均無法關閉裝置上的電流。

本裝置可能有一條以上的電源線。如要移除裝置上的所有電流，請確認所有電源線已與電源分離。



聲明 10

注意：
請勿將任何重量超過 82 公斤 (180 磅) 的物品置於已安裝機架的裝置上方。

>82 公斤 (180 磅)

Important:

Toutes les consignes Attention et Danger indiquées dans la bibliothèque IBM documentation sont précédées d'un numéro. Ce dernier permet de mettre en correspondance la consigne en anglais avec ses versions traduites dans la présente section.

Par exemple, si une consigne de type Attention est précédée du chiffre 1, ses traductions sont également précédées du chiffre 1 dans la présente section.

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Notice n° 1

DANGER

Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux.

Pour éviter tout risque de choc électrique:

- Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.
- Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.
- Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.
- Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.
- Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.
- Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).
- Lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.

Connexion	Déconnexion
1. Mettez les unités hors tension. 2. Commencez par brancher tous les cordons sur les unités. 3. Branchez les câbles d'interface sur des connecteurs. 4. Branchez les cordons d'alimentation sur des prises. 5. Mettez les unités sous tension.	1. Mettez les unités hors tension. 2. Débranchez les cordons d'alimentation des prises. 3. Débranchez les câbles d'interface des connecteurs. 4. Débranchez tous les câbles des unités.

Notice n° 2

ATTENTION:

Remplacez la pile au lithium usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.

- **Ne la jetez pas à l'eau.**
- **Ne l'exposez pas à une température supérieure à 100 °C.**
- **Ne cherchez pas à la réparer ou à la démonter.**

Pour la mise au rebut, reportez-vous à la réglementation en vigueur.

Notice n° 3

ATTENTION:

Si des produits laser sont installés (tels que des unités de CD-ROM ou de DVD, des périphériques contenant des fibres optiques ou des émetteurs-récepteurs), prenez connaissance des informations suivantes:

- **N'ouvrez pas ces produits pour éviter une exposition directe au rayon laser. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.**
- **Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent document.**

DANGER

Certains produits laser contiennent une diode laser de classe 3A ou 3B. Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques. évitez une exposition directe au rayon.

Notice n° 4

≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

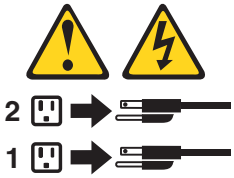
ATTENTION:

Faites-vous aider pour soulever ce produit.

Notice n° 5

ATTENTION:

Le bouton de mise sous tension/hors tension de l'unité et l'interrupteur d'alimentation du bloc d'alimentation ne coupent pas l'arrivée de courant électrique à l'intérieur de la machine. Il se peut que votre unité dispose de plusieurs cordons d'alimentation. Pour isoler totalement l'unité du réseau électrique, débranchez tous les cordons d'alimentation des socles de prise de courant.



Notice n° 10

ATTENTION:

Ne posez pas d'objet dont le poids dépasse 82 kg sur les unités montées en armoire.

Wichtig:

Alle Sicherheitshinweise in dieser IBM documentation beginnen mit einer Nummer. Diese Nummer verweist auf einen englischen Sicherheitshinweis mit den übersetzten Versionen dieses Hinweises in diesem Abschnitt.

Wenn z. B. ein Sicherheitshinweis mit der Nummer 1 beginnt, so erscheint die übersetzung für diesen Sicherheitshinweis in diesem Abschnitt unter dem Hinweis 1.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Hinweis 1

VORSICHT

Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich.

Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.
- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Signalkabel möglichst einhändig anschließen oder lösen.
- Keine Geräte einschalten, wenn die Gefahr einer Beschädigung durch Feuer, Wasser oder andere Einflüsse besteht.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem öffnen des Gehäuses zu unterbrechen. Es sei denn, dies ist in den zugehörigen Installations- und Konfigurationsprozeduren anders angegeben.
- Nur nach den nachfolgend aufgeführten Anweisungen arbeiten, die für Installation, Transport oder öffnen von Gehäusen von Personal Computern oder angeschlossenen Einheiten gelten.

Kabel anschließen:	**Kabel lösen:**
1. Alle Geräte ausschalten und Netzstecker ziehen. 2. Zuerst alle Kabel an Einheiten anschließen. 3. Signalkabel an Anschlußbuchsen anschließen. 4. Netzstecker an Steckdose anschließen. 5. Gerät einschalten.	1. Alle Geräte ausschalten. 2. Zuerst Netzstecker von Steckdose lösen. 3. Signalkabel von Anschlußbuchsen lösen. 4. Alle Kabel von Einheiten lösen.

Hinweis 2

ACHTUNG:

Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100 C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

Hinweis 3

ACHTUNG:

Wenn ein Laserprodukt (z. B. CD-ROM-Laufwerke, DVD-Laufwerke, Einheiten mit Glasfaserkabeln oder Transmitter) installiert ist, beachten Sie folgendes.

- Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.
- Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.

VORSICHT

Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.

Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.

Hinweis 4

≥18 kg ≥32 kg ≥55 kg

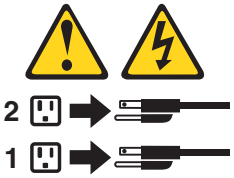
ACHTUNG:

Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5

ACHTUNG:

Mit dem Betriebsspannungsschalter an der Vorderseite des Servers und dem Betriebsspannungsschalter am Netzteil wird die Stromversorgung für den Server nicht unterbrochen. Der Server könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Servers auszuschalten, muß sichergestellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.



Hinweis 10

ACHTUNG:

Keine Gegenstände, die mehr als 82 kg wiegen, auf Rack-Einheiten ablegen.

Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione IBM documentation iniziano con un numero. Questo numero viene utilizzato per confrontare avvisi di attenzione o di pericolo in inglese con le versioni tradotte riportate in questa sezione.

Ad esempio, se un avviso di attenzione inizia con il numero 1, la relativa versione tradotta è presente in questa sezione con la stessa numerazione.

Prima di eseguire una qualsiasi istruzione, accertarsi di leggere tutti gli avvisi di attenzione e di pericolo.

Avviso 1

PERICOLO

La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa.

Per evitare il pericolo di scosse elettriche:

- Non collegare o scollegare i cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto durante i temporali.
- Collegare tutti i cavi di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Quando possibile, collegare o scollegare i cavi di segnale con una sola mano.
- Non accendere qualsiasi apparecchiatura in presenza di fuoco, acqua o se sono presenti danni all'apparecchiatura stessa.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e i modem prima di aprire i coperchi delle unità, se non diversamente indicato nelle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o delle unità collegate.

Per collegare:	**Per scollegare:**
1. SPEGNERE tutti i dispositivi. 2. Collegare prima tutti i cavi alle unità. 3. Collegare i cavi di segnale ai connettori. 4. Collegare i cavi di alimentazione alle prese elettriche. 5. ACCENDERE le unità.	1. SPEGNERE tutti i dispositivi. 2. Rimuovere prima i cavi di alimentazione dalle prese elettriche. 3. Rimuovere i cavi di segnale dai connettori. 4. Rimuovere tutti i cavi dalle unità.

Avviso 2

ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo una batteria IBM con numero parte 33F8354 o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

Evitare di:

- Gettarla o immergerla in acqua
- Riscaldarla ad una temperatura superiore ai 100°C
- Cercare di ripararla o smontarla

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/9) e successive disposizioni nazionali e locali.

Avviso 3

ATTENZIONE:

Quando si installano prodotti laser come, ad esempio, le unità DVD, CD-ROM, a fibre ottiche o trasmettitori, prestare attenzione a quanto segue:

- Non rimuovere i coperchi. L'apertura dei coperchi di prodotti laser può determinare l'esposizione a radiazioni laser pericolose. All'interno delle unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.

PERICOLO

Alcuni prodotti laser contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.

Avviso 4

≥18 kg ≥32 kg ≥55 kg

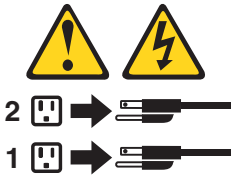
ATTENZIONE:

Durante il sollevamento della macchina seguire delle norme di sicurezza.

Avviso 5

ATTENZIONE:

Il pulsante del controllo dell'alimentazione situato sull'unità e l'interruttore di alimentazione posto sull'alimentatore non disattiva la corrente elettrica fornita all'unità. L'unità potrebbe disporre di più di un cavo di alimentazione. Per disattivare la corrente elettrica dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.



Avviso 10

ATTENZIONE:

Non poggiare oggetti che pesano più di 82 kg sulla parte superiore delle unità montate in rack.

重要：

Netfinity Server　ライブラリーにあるすべての注意および危険の記述は数字で始まります。この数字は、英語版の注意および危険の記述と翻訳された注意および危険の記述を相互参照するために使用します。

例えば、もし注意の記述が数字の１で始まってる場合は、その注意の翻訳は、記述１　の下にあります。

手順を実施する前に、すべての注意;

・記述　1

⚠ 危険

感電を防止するため、雷の発生時には、いかなるケーブルの取り付けまたは取り外しも行わないでください。また導入、保守、再構成などの作業も行わないでください。

感電を防止するため ：

- 電源コードは正しく接地および配線が行われている電源に接続してください。
- 本製品が接続されるすべての装置もまた正しく配線された電源に接続されている必要があります。

できれば、信号ケーブルに取り付けまたは取り外しのときは片方の手のみで行うようにしてください。これにより、電位差がある二つの表面に触ることによる感電を防ぐことができます。

電源コード、電話ケーブル、通信ケーブルからの電流は身体に危険を及ぼします。設置、移動、または製品のカバーを開けたり装置を接続したりするときには、以下のようにケーブルの接続 、取り外しを行ってください。

接続するには	取り外すには
1. すべての電源を切る 2. まず、装置にすべてのケーブルを接続する。 3. 次に、通信ケーブルをコネクターに接続する 4. その後、電源コンセントに電源コードを接続する 5. 装置の電源を入れる。	1. すべての電源を切る 2. まず、電源コンセントから電源コードを取り外す 3. 次に、通信ケーブルをコネクターから取り外す。 4. その後、装置からすべてのケーブルを取り外す

・記述 2

⚠ 注意

本製品には、システム・ボード上にリチウム電池が使用されています。電池の交換方法や取り扱いを誤ると、発熱、発火、破裂のおそれがあります。
電池の交換には、IBM部品番号33F8354の電池またはメーカー推奨の同等の電池を使用してください。
交換用電池の購入については、お買い求めの販売店または弊社の営業担当までお問い合わせください。
電池は幼児の手の届かない所に置いてください。
万一、幼児が電池を飲み込んだときは、直ちに医師に相談してください。
以下の行為は絶対にしないでください。
－水にぬらすこと
－100度C 以上の過熱や焼却
－分解や充電
－ショート
電池を廃棄する場合、および保存する場合にはテープなどで絶縁してください。他の金属や電池と混ざると発火、破裂の原因となります。電池は地方自治体の条例、または規則に従って廃棄してください。ごみ廃棄場で処分されるごみの中に捨てないでください。

・記述 3

⚠ 注意

レーザー製品(CD-ROM、DVD、または光ファイバー装置または送信器など)が組み込まれている場合は、下記に御注意ください。

- ここに記載されている制御方法、調整方法、または性能を超えて使用すると、危険な放射線を浴びる可能性があります。
- ドライブのカバーを開けると、危険な放射線を浴びる可能性があります。ドライブの内部に修理のために交換可能な部品はありません。カバーを開けないでください。

⚠ 危険

一部 CD-ROM ドライブは、Class 3A または Class 3B レーザー・ダイオードを使用しています。 次の点に注意してください。

CD-ROMドライブのカバーを開けるとレーザーが放射されます。光線をみつめたり、光学器械を使って直接見たりしないでください。また直接光線を浴びないようにしてください。

・記述 4

⚠ 注意

18Kg 以上

32Kg 以上

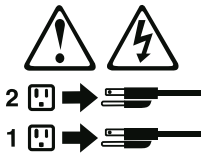
55Kg 以上

装置を持ち上げる場合は、安全に持ち上げる方法に従ってください。

・記述 5

⚠ 注意 ⚠

サーバーの前面にある電源制御ボタンは、サーバーに供給された
電流を遮断しません。
サーバーには、複数の電源コードが接続されているかもしれません。
サーバーから電流を完全に遮断するために、すべての電源コードが
電源から取り外されていることを確認してください。



・記述 10

⚠ 注意

ラック・モデルのサーバーの上に 82 Kg 以上の物を置かないで
ください。

중요:

본 *Server Library*에 있는 모든 주의 및 위험 경고문은 번호로 시작합니다. 이 번호는 영문 주의 혹은 위험 경고문과 이 절에 나오는 번역된 버전의 주의 혹은 위험 경고문을 상호 참조하는 데 사용됩니다.

예를 들어, 주의 경고문이 번호 1로 시작하면, 번역된 해당 주의 경고문을 본 절의 경고문 1에서 찾아볼 수 있습니다.

모든 지시사항을 수행하기 전에 반드시 모든 주의 및 위험 경고문을 읽으십시오.

경고문 1

위험

전원, 전화 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다.

전기 충격을 피하려면:

- 뇌우를 동반할 때는 케이블의 연결이나 철수, 이 제품의 설치, 유지보수 또는 재구성을 하지 마십시오.
- 모든 전원 코드를 적절히 배선 및 접지해야 합니다.
- 이 제품에 연결될 모든 장비를 적절하게 배선된 콘센트에 연결하십시오.
- 가능한한 신호 케이블을 한 손으로 연결하거나 끊으십시오.
- 화재, 수해 또는 구조상의 손상이 있을 경우 장비를 켜지 마십시오.
- 설치 및 구성 프로시저에 다른 설명이 없는 한, 장치 덮개를 열기 전에 연결된 전원 코드, 원거리 통신 시스템, 네트워크 및 모뎀을 끊어 주십시오.
- 제품 또는 접속된 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하거나 끊도록 하십시오.

연결하려면:	연결을 끊으려면:
1. 모든 스위치를 끕니다.	1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.	2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에 연결합니다.	3. 신호 케이블을 커넥터에서 제거합니다.
4. 콘센트에 전원 코드를 연결합니다.	4. 장치에서 모든 케이블을 제거합니다.
5. 장치 스위치를 켭니다.	

경고문 2

주의:

리튬 배터리를 교체할 때는 IBM 부품 번호 33F8354 또는 제조업체에서 권장하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 갖고 있는 모듈이 있으면 동일한 제조업체에서 생산된 동일한 모듈 유형으로 교체하십시오. 배터리에 리튬이 있을 경우 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음을 주의하십시오.

- 던지거나 물에 담그지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3

주의:
레이저 제품(CD-ROMs, DVD 드라이브, 광 장치 또는 트랜스미터 등과 같은)이 설치되어 있을 경우 다음을 유의하십시오.

- 덮개를 제거하지 마십시오. 레이저 제품의 덮개를 제거했을 경우 위험한 레이저 광선에 노출될 수 있습니다. 이 장치 안에는 서비스를 받을 수 있는 부품이 없습니다.

- 여기에서 지정하지 않은 방식의 제어, 조절 또는 실행으로 인해 위험한 레이저 광선에 노출될 수 있습니다.

위험

일부 레이저 제품에는 클래서 3A 또는 클래스 3B 레이저 다이오드가 들어 있습니다. 다음을 주의하십시오.

열면 레이저 광선에 노출됩니다. 광선을 주시하거나 광학 기계를 직접 쳐다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

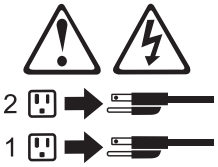
경고문 4

≥18 kg (37 lbs) ≥ 32 kg (70.5 lbs) ≥ 55 kg (121.2 lbs)

주의:
기계를 들 때는 안전하게 들어 올리십시오.

경고문 5

주의:
장치의 전원 제어 버튼 및 전원 공급기의 전원 스위치는 장치에 공급되는 전류를 차단하지 않습니다. 장치에 둘 이상의 전원 코드가 연결되어 있을 수도 있습니다. 장치에서 모든 전류를 차단하려면 모든 전원 코드가 전원으로부터 차단되어 있는 지 확인하십시오.



경고문 10

주의:
서랍형 모델의 장치 상단에 82 kg(180 lbs.)이 넘는 물체를 올려 놓지 마십시오.

Importante:

Todas las declaraciones de precauciín de esta IBM documentation empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaraciín de precauciín o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta secciín.

Por ejemplo, si una declaraciín de peligro empieza con el número 1, las traducciones de esta declaraciín de precauciín aparecen en esta secciín bajo Declaraciín 1.

Lea atentamente todas las declaraciones de precauciín y peligro antes de llevar a cabo cualquier operaciín.

Declaración 1

PELIGRO

La corriente eléctrica de los cables telefínicos, de alimentaciín y de comunicaciones es perjudicial.

Para evitar una descarga eléctrica:

- No conecte ni desconecte ningún cable ni realice las operaciones de instalaciín, mantenimiento o reconfiguraciín de este producto durante una tormenta.
- Conecte cada cable de alimentaciín a una toma de alimentaciín eléctrica con conexiín a tierra y cableado correctos.
- Conecte a tomas de alimentaciín con un cableado correcto cualquier equipo que vaya a estar conectado a este producto.
- Si es posible, utilice una sola mano cuando conecte o desconecte los cables de sent.al.
- No encienda nunca un equipo cuando haya riesgos de incendio, de inundaciín o de daños estructurales.
- Desconecte los cables de alimentaciín, sistemas de telecomunicaciones, redes y mídems conectados antes de abrir las cubiertas del dispositivo a menos que se indique lo contrario en los procedimientos de instalaciín y configuraciín.
- Conecte y desconecte los cables tal como se describe en la tabla siguiente cuando desee realizar una operaciín de instalaciín, de traslado o de apertura de las cubiertas para este producto o para los dispositivos conectados.

Para la conexin	Para la desconexiín
1. APÁGUELO todo. 2. En primer lugar, conecte los cables a los dispositivos. 3. Conecte los cables de señal a los conectores. 4. Conecte cada cable de alimentaciín a la toma de alimentaciín. 5. ENCIENDA el dispositivo.	1. APÁGUELO todo. 2. En primer lugar, retire cada cable de alimentaciín de la toma de alimentaciín. 3. Retire los cables de señal de los conectores. 4. Retire los cables de los dispositivos.

Declaración 2

PRECAUCIÓN:

Cuando desee sustituir la batería de litio, utilice únicamente el número de pieza 33F8354 de IBM o cualquier tipo de batería equivalente que recomiende el fabricante. Si el sistema tiene un mídulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de mídulo, que ha de estar creado por el mismo fabricante. La batería contiene litio y puede explotar si el usuario no la utiliza ni la maneja de forma adecuada o si no se desprende de la misma como corresponde.

No realice las acciones siguientes:

- Arrojarla al agua o sumergirla
- Calentarla a una temperatura que supere los 100°C (212°F)
- Repararla o desmontarla

Despréndase de la batería siguiendo los requisitos que exija el reglamento o la legislaciín local.

Declaración 3

PRECAUCIÓN:

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra íptica o transmisores), tenga en cuenta las advertencias siguientes:

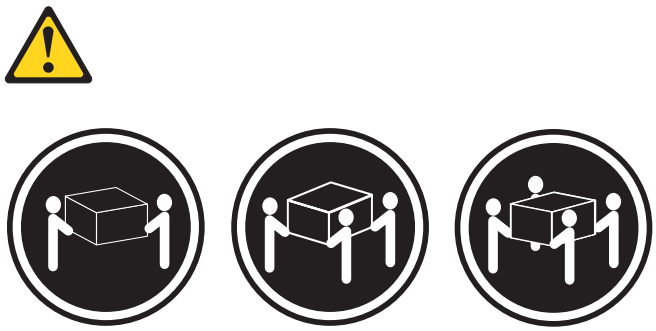
- No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiaciín láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
- El uso de controles o ajustes o la realizaciín de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposiciín perjudicial a las radiaciones.

PELIGRO

Algunos productos láser contienen un diodo de láser incorporado de Clase 3A o de Clase 3B. Tenga en cuenta la advertencia siguiente.

Cuando se abre, hay radiaciín láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ípticos; evite la exposiciín directa al rayo.

Declaración 4



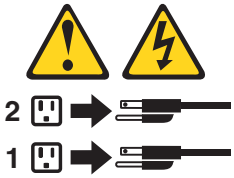
PRECAUCIÓN:

Tome medidas de seguridad al levantar el producto.

Declaración 5

PRECAUCIÓN:

El botín de control de alimentaciín del dispositivo y el interruptor de alimentaciín de la fuente de alimentaciín no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentaciín. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentaciín de la fuente de alimentaciín.



Declaración 10

PRECAUCIÓN:

No coloque ningún objeto que pese más de 82 kg (180 libras) encima de los dispositivos montados en bastidor.

Appendix C. Notices

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Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD-ROM drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Product recycling and disposal

This unit contains materials such as circuit boards, cables, electromagnetic compatibility gaskets, and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed of, these materials must be removed and recycled or discarded according to applicable regulations. IBM offers product-return programs in several countries. For country-specific instructions, refer to the following Web site: http://www.ibm.com/ibm/environment/products/prp.shtml.

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries, contact your local waste disposal facility.

In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

Electronic emission notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio

communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits.IBM is not responsible for any radio or television interference causedby using other than recommended cables and connectors or by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Taiwanese Class A warning statement

警告使用者:
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

Chinese Class A warning statement

声　　明
此为 A 级产品。在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

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Part Number: 48P9908

(1P) P/N: 48P9908